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A GEOGRAPHICAL SKETCH OF TITICACA, THE ISLAND OF THE SUN[1]

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INTRODUCTION.

Lake Titicaca belongs to that restricted group of scenic features which surpasses the expectations of experienced travelers. Its large size (100x38 miles), its profound depth (exceeding 900 feet), and its position on a mountain-bordered plateau 12,500 feet above sea level, give to the lake a unique place among inland water bodies. Titicaca (the Island of the Sun, in Inca traditions, and *Aymartharu,* in the language of the native tribes) rises abruptly from the level expanse of the lake water and is the largest of thirty-six islands and the one about which mythology and history center.

The setting of Titicaca Island is in every way picturesque. Far to the east, but plainly visible, the giant Sorata, draped in a mantle of snow with glacial fringes extending downward some thousands of feet, dominates the landscape—a mountain mass so colossal in size and elevation (21,520 feet, according to Conway) and so dazzling white in this rarified atmosphere that its outline is reflected in the waters of the lake. Trailing off to the northwest,

[1] A visit to Lake Titicaca, authorized by the Director of the Peruvian Expedition of 1912, was made possible through the courtesy of the Peruvian Corporation, represented by Mr. F. S. Blaisdell, Manager of the Ferro-carril del Sur, who furnished transportation to Mrs. Gregory and me for two traverses of the lake in the steamer *Coya.* At a later date the steamer *Yavari* was placed at our disposal, thus affording an opportunity for a study of the "Island of the Sun." I wish here to express my appreciation of the interest in scientific work shown by the officers of the Peruvian Corporation and to express my thanks to the ships' officers and to Señors Laro and Zuniga for information regarding the island and its inhabitants.

I desire also to acknowledge my obligation to Mr. A. F. Bandelier, whose admirable volume "The Islands of Titicaca and Koati" came into my hands after the return of the Expedition to the United States.

but maintaining a commanding position, the cordillera passes beyond the range of vision. From high points on the island Illimani comes into view and shares with Sorata the mastery of the landscape. Like Sorata the bulk of Illimani is incredibly enormous, and its dominance of the landscape is so complete that the intervening distance of one hundred miles, marked by canyons, plateaus, and

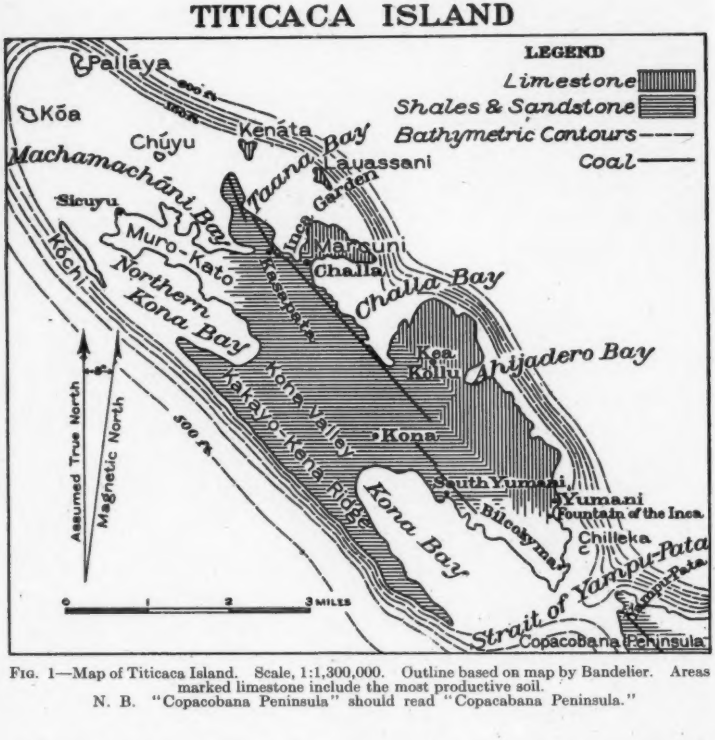

FIG. 1—Map of Titicaca Island. Scale, 1:1,300,000. Outline based on map by Bandelier. Areas marked limestone include the most productive soil.
N. B. "Copacobana Peninsula" should read "Copacabana Peninsula."

mountain groups, seems to have been eliminated. To the south and west the eye traverses ridges and steps of nearly bare rock leading to the summits of the Western Cordillera. Between the two ranges lies the Titicaca plateau—*altiplanicie* of the Spaniards—a region which exhibits considerable relief when the rugged Cordillera Real and the Maritime Cordilleras are eliminated from view.

During the time spent on and about Titicaca the sky was a constant source of delight, and, if November scenes are in any way

typical, I can imagine no place where the painter of clouds and sunsets and atmospheric effects could find a more promising field. Rarely is the sky without cirrus and stratus clouds, while cumulus and nimbus forms mark the passage of storms. The brilliant sunsets which light up the west with bands of fiery red and purple give to the water a bronze glow peculiarly fascinating in its subtle changes. On three occasions the sunset colors were so strong and so brilliant that the crests of the Cordillera Real received a coating of gold interrupted by bands of violet marking the position of glaciers and névé fields. The captain of the steamer informed me that " alpenglow " is not infrequently seen.

The surface of Lake Titicaca is interrupted by numerous islands and by forests of reeds, which in places extend far out from shore and even close the passage into the smaller bays. The water of the lake itself reflects the deep blue color characteristic of mountain lakes, but its surface is streaked with curious bands of green—a phenomenon for which I have no explanation to offer. During our stay the lake was calm except for the small waves lapping the beach and the rippled surface and moderate surf caused by the wind of an afternoon storm. During the southern summer, however, the natives report that squalls and rough water are frequently encountered and that navigation in the canoe-like *balsas* becomes precarious. The shores of the lake and the islands are practically bare of vegetation and exhibit the brown tones so commonly met with in semi-arid regions. Here and there scattered vegetation adds variety to the landscape, but bare rock and flats of gravel are predominating features even along the stream courses. Approaching Titicaca Island, patches of green, marking the site of cultivated fields and of springs, become visible, and the outline of ancient terraces (*andenes*) are shown by lines of grass, shrubbery, and occasionally of trees.

As seen from Titicaca Island the grouping of snow-clad mountain peaks, barren foothills, desert, intermontane flats, in the midst of which is set a lake dotted with islands of rock and of reeds, constitutes one of the magnificent panoramas of the world. To me the entire setting of the Island of the Sun is interesting and beautiful, and to one who has felt the fascination of desert scenery "dismal monotony," " unprepossessing belt of bleak slopes, rocky humps, and scattered islets," "utter desolation" (phrases used by certain writers) seem strangely out of place.

An additional interest is given the scene by the thought that the waters of the lake were navigated and its shores and islands

inhabited for centuries by a vanquished race whose story has never been told.

PHYSICAL ENVIRONMENT.

The fundamental influence in human affairs of topography, climate, soil, water-supply, fauna and flora, is well illustrated by the Indians of Titicaca, whose struggle for existence and advancement has been directly with nature, modified only in small degree by other influences. Segregated in small communities scattered along the shores and on the islands of Lake Titicaca, each group engaged in the absorbing task of securing a bare livelihood, there was little opportunity for mutual uplift and for learning or practicing those arts which lead to higher stages of civilization. Exhausting and continuous physical exertion combined with scant nutrition appear to be unsuitable soil for the cultivation of higher intellectual and ethical concepts. Contemporaneous groups at La Paz, Cochabamba, Cuzco, and Arequipa, which, because of more favorable environment, attained a higher status, were separated from the Titicaca tribes by an inhospitable zone across which their influence was but rarely extended. While there is evidence for the belief that climatic fluctuations have from time to time produced more favorable conditions than now surround these people, still their continuous subjection to nature is evident. Doubtless, for centuries, the Indians of Titicaca Island have been agriculturists and herdsmen, and the crude stage reached in both these occupations reflects their physical environment.

Topography.—The island of Titicaca is essentially a continuation northwestward of the peninsula of Copacabana, from which it is separated by the straits of Yampupata (Figs. 1 and 2). The island rests on a narrow underwater platform from which emerge also seven small islands, all less than two miles from the larger mass. Immediately bordering the submerged platform the water attains on the north and west sides a depth exceeding 600 feet, and even at the south, where Titicaca is separated from Copacabana Peninsula by about three-fourths of a mile, the depth of water in the straits is something more than 100 feet. The coast line of Titicaca Island is deeply indented. Besides the larger bays shown on the map there are fifteen or twenty smaller indentations, each with its narrow belt of beach, marking the mouths of ephemeral streams. The beaches are not extensive, and a traverse of the strand line involves the climbing of precipitous cliffs which, rising abruptly from deep water, form headlands of bare rock (Fig. 4). The low,

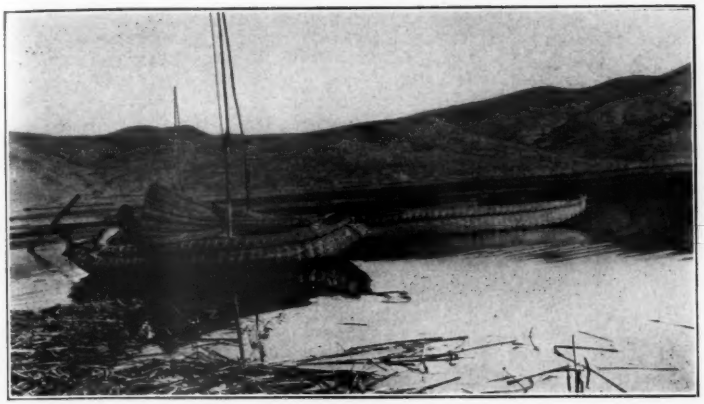

FIG. 2—General view of the Bolivian shore. Note the barren, maturely developed hills and the wide extent of delta flat. The "totora" *balsas* in the foreground are typical in shape and construction, but are larger than the average.

FIG. 3—Field of *totora*, four miles from shore. The Aymara Indians in their tiny craft are collecting these reeds for the construction of *balsas*.

FIG. 4—The village of Kea, looking southwest. Note the terraced fields (*andenes*), the absence of vegetation, and the character of the coast line. K. C. Heald, photo.

narrow beaches of sand and wave-worn gravel slope gently lakeward for a short distance only to drop abruptly into the depths. No wharfs of more than a few feet in length are found on the coast, and so sudden is the drop from narrow beach to navigable water that the lake steamers may safely approach within one to two hundred feet of the shore, even in sheltered coves.

In ground plan the island is a ridge with a length of approximately seven miles; its width is in most places less than two miles, and only at one point was a width of three miles measured. United to the central ridge by a broad band is the secondary ridge of Kakáyo-Kéna—a remarkable hogback of resistant sandstone which faces the lake as a precipitous wall nearly five miles in length. On the opposite side of the backbone the promontory of Kea-Kollu attains an abnormal development owing to the character and attitude of its strata, and additional irregularity is given to the outline by the peninsula of Marcuni, which, in reality, is a rock island tied to the main land by a low, double-faced beach. With the exception of the cliffs which characterize the coast line and the steep faces of inclined strata, the surface of the island exhibits little sharp relief. Flattened domes and rounded ridges with northwest-southeast trend, separated by flat valleys and broad divides, give to the island its surface topography. A large part of the island maintains a height of 400 to 500 feet above the level of the lake, and at the most elevated points a barometer reading of over 800 feet (13,300 feet above sea)[2] was obtained.

Soil.—The soil of the island is distributed in patches which vary widely in physical character and in potential fertility. Something like one-fourth of the surface is bare ledge which supports vegetation only in crevices and along joint and bedding planes. Another large area is covered by a film of decomposed rock containing little of the finer material demanded by plants. Even in the better fields, boulders make up a considerable proportion of the soil constituents. With the exception of insignificant alluvium and beach deposits, the soil of the island has been developed *in situ* from the underlying rock, and, since bed rock is prevailing sandstone and siliceous shale, there is a general deficiency of inorganic plant foods. Along the belt passing through Challa and North Yumani the underlying limestone produces more favorable conditions, and here are located the more fertile fields, the larger villages and the only extensive hacienda on the island. Speaking broadly,

[2] I am unable to account for the error of Squier (Peru, p. 335), who states that the crest of the island is 2,000 feet above the lake and that paths run along "dizzy eminences."

the indefinite line separating tilled from grazing areas corresponds to the geologic boundaries of limestone and sandstone (see map, Fig. 1). Soil water on the slopes and higher lands is frequently deficient, owing to the seasonal distribution of rain and to the rapid run-off which allows inadequate soil absorption. On the other hand, swamps and seeps of an acre or less in extent occur along or near the coast.

Water Supply.—Water for irrigation and domestic use is supplied by streams of steep gradient rarely exceeding one-half mile in length. With the exception of a few tiny rills fed by springs and seeps, the water channels are abandoned during the dry season (June to December). During the rainy season the larger stream courses are filled and emptied in response to the passage of storms. Numerous springs of limited and fluctuating flow, with water sufficient for the irrigation of garden plots, occur especially along the northeast coast, where the attitude of the rock and the composition of the soil cover are favorable. The water of the lake, especially if taken some distance from shore, is palatable and all of it is suitable for household purposes.

Climate.—The fundamental factors which determine the climate of Titicaca Island are latitude (15° 20′ to 16° 35′ S.), elevation above sea (12,500 feet), insular position in a lake of considerable size, and location on a wind-swept, mountain-bordered plateau. The temperature is characterized by uniformity. Bandelier records a mean temperature of 55° for summer and early autumn with variations from month to month of less than 1°. The maxima and minima were: January, 63.5°, 47°; February, 65°, 45°; March, 64°, 43°. The annual range of temperature, based on Bandelier's figures, is 32°. During July and August, the southern winter, Le Maire obtained four noon readings with a mean of 50.9°. These readings were obtained at four different stations, including Puno (57.3°), which, because of its location, gives abnormally high values. My noon readings for the last three days of November were 52°, 55°, 54.3°, respectively. Agassiz observed noon temperatures of 54.3°, the mean of four successive days in February. The winter records for the island of Koati given by Bandelier for the period June 18th to July 1st are: maximum, 50°, minimum, 33°. Ice was noted at Huarina on August 18th and by Conway on August 26th—a phenomenon which the ships' officers say is not infrequent, though always confined to shores and shallow bays. While the observations thus far made lack the continuity and localization demanded for scientific discussion, they are, when taken in connection with

non-instrumental observations, sufficient to show moderate monthly and annual ranges of temperature and the absence of extreme heat and extreme cold from the islands of the lake. However, the daily temperature range is considerable. Agassiz (quoted by Le Maire) gives 9.1° C., 6.6° C., 10.5° C., 5.5° C., as the difference in temperature between early morning and the hour of greatest heat during the months of January and February, 1875. Le Maire recorded 41.9° on July 25th at 5.30 A.M. at Challa and 33.8° at 6.45 A.M. at Puno on August 1st. The means of temperatures taken at Puno,[3] November, 1888, to March, 1889, inclusive, are: mean, 53.6°, maximum, 64.5°, minimum, 38.5°. The highest record was 71°, and the lowest 33°. The mean annual temperature of La Paz based on nearly ten years' records, as given by Merchant,[4] is 50.4°; the lowest temperatures occur in June and July, which give a mean of 45.3°, with an absolute minimum of 26.6° (June, 1901). The warmest months at La Paz are: November (53.9°) and March (54.7°). A maximum of 75.2° is recorded for January, 1903.

The sensible temperature is much less agreeable than the instrumental observations indicate, because the air, while cool, is also moist and chilly, and the increased insolation due to altitude makes midday temperatures of moderate amount appear uncomfortably hot. The variation of the temperature from hour to hour is a noticeable feature of the climate and doubtless accounts for the conflicting evidences afforded by instrumental observations. A temporary clouding of the sky produces a marked drop in temperature, while the sudden appearance of the sun is quickly recorded on the thermometer. While at work on Titicaca on several occasions a change of 5° to 10° was noted during a period of twenty minutes or less. At night it is uncomfortably chilly, in the afternoon uncomfortably warm; and putting on and taking off sweaters as clouds came and went was a feature of our daily work. Combined with the altitude the daily and hourly fluctuations of temperature seriously interfere with continuous, effective physical labor, even on the part of the natives.

Reliable precipitation records for Titicaca are wanting, yet the chief facts are sufficiently well known. The months of maximum precipitation are November to April, during which time thunderstorms may occur any day, and as many as one-half the days in a month may be marked by downpours. June to December is the dry season, during which time, however, rains or snows accompanied

[3] *Annals Astron. Observ. Harvard Coll.*, Vol. XXXIX, Part 1, 1899.
[4] Estudio sobre la Climatologia de La Paz. La Paz, 1905.

by thunderstorms occur at infrequent intervals. Rainfall records at Puno give a monthly mean for the rainy season (November to March, 1888–89) of 5.81 inches. Of 151 days on which observations were made, 67 were without rain. The total amount of precipitation on Titicaca Island probably does not exceed 35 inches,[5] and is distributed as short-lived showers rather than as downpours of long duration. As is to be expected in a region of varied topography and sudden short showers, there is wide variation in the amount and character of precipitation at neighboring localities.

Winter winds are prevailingly northwesterly, while those of the summer season come from the opposite quarter. The winds are, however, exceedingly variable in direction and violence. Sudden severe gusts, dangerous to navigation, are frequent accompaniments of summer storms, particularly through narrow straits as at Yampupata and Tiquina, where violent local winds are liable to be encountered. The influence on climate of the waters of Lake Titicaca, covering approximately 4,000 square miles,[6] must be considerable. So far as observations go the Titicaca shores have smaller annual, monthly and daily temperature ranges, more rainfall, and less rigorous and inhospitable climate than is encountered at other points on the *altiplano*.

The surface temperatures of the water of Lake Titicaca, as noted by Agassiz for the months of January and February, 1875, taken morning and afternoon, range from 53.9° to 59°, with only two of twenty-nine observations above 57.3°, and one below 54.68°, the mean of all observations being 55.8°. Le Maire's records for July, taken at various times during the day, give a mean for thirty-two observations of 52.55°. These two sets of observations may be taken to represent winter and summer conditions. The daily variations for the last six days of July were found by Le Maire to range between 1.6° C. and 0.3° C., a mean of 0.87° C. During the winter the temperature of the water is lower in the large division of the lake than in its smaller companion or in bays. During the summer the opposite conditions prevail. It is interesting to note that the waters of the lake maintain a mean temperature higher than that of the overlying atmosphere.

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[5] Bartholomew's Meteorological Atlas gives the mean annual rainfall of the Titicaca region as less than ten inches.

[6] No complete instrumental survey of Titicaca has been made. The figures used in this article are from Le Maire, whose traverses between July 13 and August 15, 1903, have resulted in the production of a map sufficiently accurate to replace those of Raimondi (1873), Marcoy (1877), Viscarra (1900), as well as the fantastic representations of several other writers. Markham's excellent map of South Peru and North Bolivia, *Geographical Journal*, 1910, includes data from Le Maire.

Fauna.—The indigenous fauna of Titicaca Island includes the llama and his relatives, the vicuña, guanaco and alpaca; the viscacha (a badger), guinea pig, field rat, lizard, toad. Birds are numerous and include the gray eagle, heron, a buzzard, besides song birds, and several species of water fowl. Bandelier mentions the presence of spiders, a scorpion, beetles, and a variety of hymenoptera. Hogs of uncommon aspect, which wade into the lake for food, cattle, which, like the ponies of the Hatteras beaches, have developed the habit of thrusting their heads deep into water to secure the succulent bases of reeds, chickens, dogs, cats, donkeys, probably date from the Spanish invasion. Agassiz describes two genera of fish from Lake Titicaca: *Trichomycterus* (a siluroid) with one species and *Orestias* with five species, and calls attention to the fact that the fauna of the lake in general is characterized by abundance of specimens and paucity and uniqueness of species. The isolated position of Titicaca, its elevation, its temperature, its silt-covered bed, and the limited variety of fish food, naturally tend to specialization of genera.

Flora.—The native flora of the island is wholly shrub and grass, with a sprinkling of annual and perennial flowering plants of inconspicuous size. In favorable localities on northern exposures are limited areas carpeted with green, as the bottom lands at Pucara and the grass-covered, rounded summits and divides of Ciriapata and Marcuni. And at the extreme northwest projection are thickets of gnarly, spine-protected shrubs. Elsewhere plant life is sparsely distributed, and over wide areas plants are to be found only in rock crevices, or along decaying artificial walls and *andenes.* A tall yucca (" kara " in the Aymara dialect; " comida de osa " of the Spaniards) predominates on steep slopes. Three indigenous trees have been described, species determined as *Polylepsis racemosa,* called by the natives "kenua," *Buddleya Coriacea,* a wild olive, and *Sambucus Peruvianus.* They are stunted and sharply localized. Perhaps the most attractive plant is the " Flor del Inca " (*Cantuta buxifolia*), a flowering shrub used as a model by the Inca decorators of pottery. Potatoes are native to the whole Andean plateau, and several species or varieties are indigenous to the islands and shores of Titicaca, only a few of which have been domesticated. A cabbage occasionally attaining the dimensions of a shrub is a feature of the landscape. The " totora," a reed ten to twenty feet in height, grows profusely and forms a belt a few feet to a mile or more wide, where shallows permit a foothold, and serves as a guide to the depth of the water. At the entrance to the bay of Puno and again at

Guaqui the growth is so rank that artificial canals are required for the passage of steamers (Fig. 3).

With the advent of the Spaniards trees and garden plants and flowers found a place, and such as would thrive in this inhospitable climate are represented on the island, confined, however, to localities where soil and water and sun and care of man combine to produce favorable conditions. Thus in the "Garden of the Incas" at Challa and again at Yumani are found eucalyptus and willows, violets, heliotrope, geraniums, roses, dahlias, pinks, and other European plants, as well as vegetables and fruits of temperate zones. As remarked by Bandelier, the attractive floral features of Inca settlements on Titicaca date from colonial times. The same might be said of Cuzco and other centers of Inca population. Divested of all which the Spaniards supplied, these "gardens" would still be attractive to one who sees beauty in landscapes slightly modified by human activity, but would scarcely appeal to the casual traveler.

The native elements of food, used by the original inhabitants and present population alike, consist of fish, especially the boga (*Oretias Pentlandii*), the llama and related species, the viscacha, ducks, birds' eggs, the tender parts of the totora, oca, quinoa, but chiefly the potato. This supply doubtless was supplemented somewhat by hunting expeditions on the mainland and by the transport of tropical fruits from the lands beyond the eastern Cordillera. The food of the present inhabitants includes the indigenous meats and vegetables supplemented by the addition of mutton, beef, corn and barley.

Fuel.—The native fuel consists of roots and branches of shrubs exceedingly limited in amount, and of "taquia" (llama dung). The latter has played an important rôle in the life of the aboriginal and present inhabitants alike. Since there are no trees within a hundred miles of the lake, the *taquia* was the only available material and took the place of wood and coal, not only for household purposes, but also for copper smelting and later to supply the furnaces of steamers navigating the lake.[1] Camping on the Titicaca plateau and islands involves carrying an oil stove, and the luxury of a camp fire is not to be had. Fortunately the llamas have the admirable habit of depositing their excrement in selected places to which they repeatedly return and thereby accumulate large quantities of this indispensable material.

As outlined above the physical environment of the natives of Titicaca forms an uninviting prospect. Scenery most magnificent,

[1] Orton reports that the steamer in which he crossed the lake in 1876 used dung for fuel.

marked by grandeur, variety and beauty of color, is combined with an unpropitious climate, scarcity of food and fuel, and, from the standpoint of physical comfort and industrial progress, the island may indeed be called monotonous and forbidding. The lot of the aborigine on the Titicaca plateau has been concisely described by Bandelier.[8]

> Nature is most cheerless in that region. Dismal monotony reigns all around, in topography, and in color of landscape; a stunted vegetation, animal life distributed by local groups and with few prominent forms. The climate is as monotonous as the landscape, in the slight variations of temperature which it exhibits throughout the year; cold, moist, and abounding in threatening phenomena, dangerous to man directly and indirectly. There are no means for rendering comfortable the shelter which one builds, for the Puna has scarcely any combustible material within reach of the native except llama dung: "taquia." The only redeeming features are: The sight of the glorious Andes, and the magnificent sky, when it condescends to exhibit itself in full splendor. These redeeming features, however, have no influence on the Indian; *his* heart is untouched by beauties of nature.

Furthermore there is at present no undisputed evidence that nature was in any marked degree more hospitable at any time during the human epoch. In the days when the Island of the Sun was the center of a powerful religious cult whose devotees brought treasure and building materials and even soil from regions far removed, the contest with nature must have enlisted the physical and mental energies of the group. Why then should a region so unfavorable from the standpoint of civilized man be marked by long and continuous occupation? The explanation, I believe, lies in the facts that the island is a natural refuge, not easily reached, that fish, water fowl and potatoes furnished a reliable source of food, and that the plateau as a whole is still less adapted to man's needs. It is probable also that more suitable localities on the great plateau had previously been occupied and perhaps overpopulated.

ADJUSTMENT TO ENVIRONMENT.

To the physical factors of his environment, the Titicaca Indian slowly became adjusted and, spurred on by the imperative demand for sustenance, followed the suggestions of nature, and in a crude way, at unbelievable physical exertion, developed agriculture and the arts of caring for stock and catching fish. Agriculture is now

[8] The Islands of Titicaca and Koati, p. 20.

the chief occupation of the seven hundred Indians inhabiting the island, and probably differs in no essential of kind of crop or method of culture from that practiced during the Inca Empire. Potatoes of several varieties, quinoa, beans, a little corn, and some barley are the principal crops. Small, knobby potatoes in the natural state or as "chuña" (potatoes frozen, then dried) are the mainstay and, for the poorer families, may constitute, with mutton, nearly the whole bill of fare. By selection of seed and variation in time of planting, the potato harvest is extended over several months. Coca, transported from the Yungas Valley, is the solace of Aymara and Quichua alike, is universally used, and reaches the dignity of a food in the Indian dietary. Cultivation is almost wholly hand work performed with implements so crude in design and construction that even when oxen are used the saving in labor is inconsiderable. Sheep dung is used as a fertilizer.

In a region where rainfall is seasonal and fluctuating in time and amount and where soil is deficient in nitrogen, irrigation and drainage and terracing and systems of crop rotation naturally become features of agricultural practice; and the Aymaras, even before the Inca invasion, apparently were aware of the advantages to be derived from the development of these arts. On Titicaca Island irrigation by gravity ditches of crude workmanship is in evidence. The system of conduits feeding the "Fountain of the Incas" at Yumani, described as an irrigation plant, is in reality a device for drainage of an overwatered flat, for, as first pointed out by Bandelier, the buried troughs are below the level of the fields which they are supposed to have irrigated. At the "Garden of the Incas," near Challa, a system was devised for the combined purposes of drainage and irrigation of a very small tract of productive land.

Frequent crop failures have led the Indians to supplement their efforts in controlling the water-supply by calling in supernatural agencies. Each spring and water course has its familiar spirit. A part of the "Chayll'pa" dance consists of throwing stones or toads into the lake, as a means of calling the attention of the divinities to the perilous state of the crops. My guide spoke of the native belief that to disturb the bones of ancestors is to ensure drought—a notion which may account for the strenuous objection in some districts to the desecration of sepulchres under the guise of archæological research. Similarly, excess of rain is prevented by exposing a skull taken from a burial place at some conspicuous point, occasionally placing a cigarette between its teeth—a performance which

Fig. 5—Incaic wall forming the front of an *andene*.

Fig. 6—Incaic "temple" wall at Yumani.

FIG. 5—Incaic wall forming the front of an *andene*.

FIG. 6—Incaic "temple" wall at Yumani.

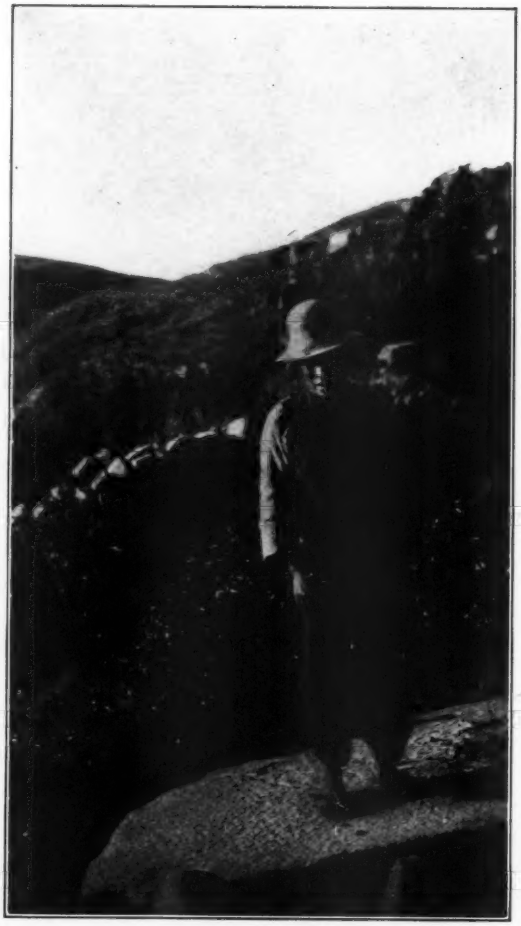

FIG. 7—Aymara Indian, Titicaca Island.

I am informed is entered into most seriously and with confidence in the results. Faith in the guardian spirits of cloud and storm is shown by the well-known fact that the Indians of Tiahuanaco invoke the rain gods by sacrificing coca, and so mysterious and powerful are meteorological phenomena believed to be that children are forbidden to gaze at a rainbow. Analogous ceremonies are practiced by the Quichuas of Peru, which invite a suggestive comparison with the Snake Dance of the Hopis and the processions and dances of other Pueblo tribes.

Terracing of hillsides to retain the soil is essential to profitable agriculture where steep slopes, scantily clothed with vegetation, predominate, and the farmers of Titicaca Island have built an elaborate system of *andenes* designed to preserve the small amount of arable soil available (Fig. 4). These terraces, with fronts rising two to fifteen feet, and each one reclaiming a fraction of an acre of land, follow the contour of the hills and rise as a series of steps four or five to twenty in number. They are confined almost entirely to north and northwest slopes where exposure to the sun provides the necessary warmth. In cruising among the islands and particularly at the straits of Tiquina and in the Lago Pequeno, the stranger might determine his directions by noting the position of *andenes,* cultivated and abandoned, which striate the slopes. Pre-Inca, Inca, and post-Inca *andenes,* distinguished by their types of workmanship, are represented (Figs. 5 and 6).

Rotation of crops, or "fallowing," is required in order to insure the accumulation of nitrogen, phosphorus, and other essential plant foods. Abandoned fields do not therefore always indicate decreased agricultural activity or diminished population. A four-year period of rotation would in general require about four times the present acreage of tilled land to support the existing population. In view of this fact and of the agricultural possibilities of Titicaca, it is doubtful if at any time the population of the island supported by local food supply exceeded in any appreciable amount the 700 or 800 Indians now occupying it.

Access to the mainland and intercourse between the island communities is made possible by the curious *balsas,* canoe-shaped boats frequently united in pairs with hulk and sail alike ingeniously constructed of native reeds (*totora*) (Fig. 2). The *totora,* gathered along the south shore of the island, are tied in bundles, which in turn are lashed together by vegetable fibers. To the stranger the *balsa* is an uncomfortable and unsafe craft, but, driven by necessity, the Indian has developed such skill and daring that, not fearlessly,

but in spite of fear, he navigates the lake from end to end, more or less regardless of sudden violent squalls. His skill in righting his overturned craft in rough, chilly water excites admiration. Posnansky states that a yoke of oxen has been carried in a single large *balsa*, and believes that the gigantic monoliths of ancient ruins bordering the lake were transported in these frail craft.

Animal husbandry in pre-Colonial days consisted in the care of llamas, limited in number by deficiency of grazing lands, as are also the small flocks of sheep and smaller number of low-bred cattle, which require the attention of the present inhabitants.

The Aymara Indians, who, with the addition of a dozen Spaniards, constitute the population of Titicaca Island, are stockily built and somewhat below medium height (Fig. 7). The Aymara is a good workman in a perfunctory way, and while not mentally alert or possessed of initiative is by no means stupid; while his mental processes apparently lack directness and simplicity, he can hardly be called crafty in spite of his skill in bartering and in accomplishing good or evil by roundabout methods. Like other South American plateau Indians, the Titicacan's dress consists of woolen shirt and short trousers, supplemented by a hat or by a cap with ear-laps. His feet are bare, and it is a constant source of wonder to see these people warmly clad about head and shoulders, wading in the cold lake waters, tramping over chilly, moist rocks and even wading through snow with no protective clothing below the knee. The costume of the women differs little from that of the men, except for the addition of innumerable short skirts. Laundering is a little practiced art. Little wonder that coughs and pneumonia are persistent tribal diseases.

Houses are assembled in groups rather than in villages; land is held in common and redistributed at stated intervals. There is a division into clans governed by elective officers, and marriage is allowed both within and without the clan group. The stage of development of arts and industry, as well as religious, social and burial customs, remind me forcibly of conditions observed among the Pueblo tribes of New Mexico and Arizona, and, as with the North American races, the Aymara arts appear to have reached culmination at some remote date and to have later declined. In my view, the Titicaca Indian of to-day differs little from his ancestors who first occupied the Island of the Sun. The one hundred years' domination of the Incas has left few traces except buildings and perhaps a slight modification of agricultural practices. With the coming of the Spaniard in 1533, new types of domestic animals and

plants were introduced, which increased the food supply, but were otherwise of little value to the island population.

To his mental outfit the forced acceptance of Christianity added new conceptions, the net result of which appears to be an elaboration of an already intricate hodgepodge of mysticism and nature worship by the addition of a maze of indigestible ideas. With the new régime came also forced contributions levied on a people already pitiably poor; as if the exactions of nature were not a sufficient handicap. To my mind, "discouraged," "despondent," "indifferent," attitudes of mind resulting from centuries of struggle with nature—a struggle whose issue is always in doubt—more nearly describe the Titicaca Indian, than "indolent," "surly," "wicked"—terms frequently used in speech and in print.

Titicaca Island may be visited by arranging for transportation at Puno, the Peruvian terminus of the Ferro carril del Sur. The journey will well repay the time and effort expended.

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THE BALKAN PENINSULA*

By LEON DOMINIAN

I propose to describe the Balkan Peninsula this evening as a remarkable highway. Before mankind had begun to record its past this region had afforded a natural passage, by virtue of its geographical situation, for the westerly migration of Asiatic races fleeing from the aridity of their land of origin. Throughout historical times it has constituted, with Asia Minor, a natural bridge joining the East with the West. To-day the region bids fair to maintain the same rôle, with the difference that the trend of human flow appears destined to be directed toward the east instead of toward the west.

Let us consider some of the geographical causes that have determined this particular condition. To do this adequately I shall ask you to forget, for the moment, that we have reached the stage in which we are able to modify the surface of our earth in accordance with our requirements; that we can irrigate desert lands, changing them into veritable Edens, or that we know how to build interoceanic waterways like the Panama Canal so that former obstacles to man's travels now concur in promoting them. Instead I invite you to consider those early stages in the human race's growth, during which man's life, unconscious of its potentiality, was largely shaped by the nature of his physical environment.

Think of the Asiatic tribes, nomads by necessity, who roved because the barren steppes of their birth failed to provide more than could be harvested in a single halt. These ancestors of the modern Khirgiz poured into Europe from proto-historic times. They were herded along by nature toward that most favored parallel of latitude, the 40th, adjoining which civilization has flourished preëminently. In their quest for sustenance they wandered along a path that led toward the smiling regions bordering the Mediterranean basin. Here fertility of soil and propitious climate rendered settlement possible.

How readily the peninsula affords easy access between Europe and Asia can be gathered from the map. The narrow watercourse which begins at the Ægean mouth of the Dardanelles and extends to the Black Sea entrance of the Bosporus provides, at both its extremities, the shortest fording places between the two continents.

*The substance of an address delivered before the American Geographical Society at its intermonthly meeting of December 10, 1912.

The Bosporus looking northwards. It takes nearly an hour to go to the other at the narrow section shown here. The left shore is European, the right, Asiatic.
Photo by Sebah and Joaillier, Constantinople.

The Bosporus looking northwards.
The left shore is European, the right, Asiatic. It takes twenty minutes to row from one to the other at the narrow section shown here.
Photo by Sébah and Joaillier, Constantinople.

At Chanak, in the Dardanelles, about one mile and a half of channel separates the peninsula of Gallipoli from the Anatolian coast. A twenty minutes' row from Rumeli to Anadoli Hissar, on the Bosporus, has comprised many a time my only exertion in crossing from Europe to Asia. The very outline of the European shore is symbolical, for by means of the Thracian and Gallipoli promontories, the Balkan Peninsula appears to stretch out two welcoming arms to Asia and thus invite intercourse.

South of the straits, the deeply indented coast lines of Greece and of Asia Minor teemed with matchless harbors. Their shores became the birthplace of adventurous sailors. The Ægean itself, with its numberless islands, provided so many stepping stones jutting out of its choppy waters to aid daring pioneers in their expeditions.

But communication with the favored zone by means of the peninsula was not merely confined to an east-west route. A second and fully as important human flow rushed southward from the north. In this instance also do we turn to geography for a proper explanation of the historical problem involved. A short review of the geography of the region lying to the northeast of the valley of the Danube readily leads us to perceive how natural it must have been for ancient migratory tribes to proceed toward the south in order to escape from the bleak and cheerless climate prevailing along their northerly path.

Arid wastes and freezing winds have hence contributed to make of this peninsula the crossing point of two main highways overrun by man since prehistoric times.

Almost every race of the world has marched at some time or other through the valleys that extend in varying width between the uplifts rising south of the Danube and the Save. The attempt to reconstitute the autochthonous element is almost futile in the face of the constant stream of invaders. To go back only to the period following the one in which the Thracians dotted the southeastern area with their quaint tumuli we find the peninsula already settled by Illyrians on its western border. The Albanians are supposed to be direct descendants of this ancient race. Secluded in their mountain fastnesses from contact with subsequent invaders of the peninsula, they best represent to-day the type of the peninsular inhabitant of about 2000 B.C. To the east the basin of the Danube was peopled subsequently by Dacians and Gaetes who presumably were the ancestors of the peasants now occupying the Dobrudja.

North of the boundary-defining rivers dwelt the Scythians and the Sarmatians. The paginal sequence of an historical atlas suffices to intimate the trend of these migrations. In substance the story is the same for different epochs. It tells either of the appearance of sturdy barbarians before whose savage dash the settlers, somewhat effete on account of acquired comfort, give way. Or else it is the tale of the settler who has had time to organize his forces into orderly fighters and whose disciplined bands go forth to conquer new territory in behest of his civilization. Thus did Macedonian phalanxes clash with Persian cohorts on the battlefields between the Adriatic and the Black Sea. Later, Roman legions swept victoriously onward in their march toward new colonies.

Following the Roman occupation of the peninsula a steady flow of uncouth northerners began to appear. Under the names of Sarmatians, Goths of various denominations, Huns, Bulgarians, to whom the Byzantines gave their appellation because they came from the banks of the Volga, and Avars, they spread havoc far beyond the western limits of the Adriatic. These barbarians were followed by the Slavs with whom there is reason to surmise that they had fairly close bonds of kinship.

The eastbound journeys of the Crusaders next intervene; then a final mighty onslaught of Turkish hordes whose savage fury seemed for a moment to obliterate the laboriously reared western civilization.

To this bewildering succession of human types the extraordinary complexity of stock characterizing the present population of the peninsula is directly ascribable, each race having left some trace of its passage. The compilation of an ethnographical map of the region would result in the representation of the most mosaic-like surface imaginable.[1] Nor are the actual evidences of these prehistoric invasions lacking to the observant mind. Take for instance, the fair-haired, blue-eyed Greeks, totally devoid of traces of nigrescence, who are by no means uncommon in Macedonia.[2] In them the Nordic type due in part to the semi-barbarian conquerers of the Minoan kingdoms has survived. To this day the tourist wandering in any town formerly occupied by the Turks may suddenly behold in the streets as pure a Mongolian type as is to be

[1] Since the above was written I have had occasion to examine Cvijić's excellent ethnographical map of the Balkans, q. v. (Taf. 22, *Pet. Mitt.*, Vol. 59, I, March, 1913). Its appearance fully corroborates my description.

[2] I have also seen this type among Anatolian Greeks. It is observable among Greeks living in New York.

found on the highlands of western central China. In the Bosnian town of Sarajevo, as in the Macedonian villages north of the Ægean, the ugly features of these Asiatics often reveal but too plainly their origin. Be it reversion to the original type by the working of unknown laws of heredity or be it preservation of like facial lineaments through persistence in abstaining from intermarriage with the subjugated races, a common occurrence where religion has imposed the strictest of barriers, the phenomenon recurs not unfrequently.

Traces of these "Völkerwanderungen" have lingered in the relics of former habitat observable in Balkan countries. Any one whom fate has made the guest of Turkish hosts will remember how toward bedtime rolled bundles leaning vertically against the corners of the rooms are brought out and laid open on the floor. These are the beds which the members of the household use. They consist of a mattress, sheets and blankets which had been removed during the day from the mat over which it is customary to spread them at night. Although it is centuries since the Turk has ceased living in tents, he still adheres to this custom of his nomad forefathers. The fact is observable in the two-storied dwellings of the Mohammedan sections of Adrianople or Constantinople. But the practical conversion of bedrooms into sitting rooms is only one of the many phases of Turkish indoor life which recall tent life. Rooms altogether destitute of furniture are very usual. I am now referring to the average Turkish home—not to the relatively few in which European customs are observed. In the majority of cases the only furniture consists of rugs spread on the walls and floors. Articles of household use are kept behind doors in closets. No chairs or tables help to fill the bareness in sight. At meals, the family will squat in groups around circular trays supported on low stools. A bowl of "yoghurt," or curdled milk, is the invariable accompaniment of each repast. Indulgence in this preparation is observable with similar frequency in a broad belt which begins in the Balkan Peninsula and extends eastward between parallels 45° and 35° of latitude to Mongolia. Signs pointing to Asiatic origins can likewise be witnessed outside the houses in Turkish cities. The national coat of arms, conspicuously displayed over the gates of government buildings, bears two horsetails surmounting the prophet's coat. In this emblem we see Tartar chieftains' insignia of rank which have been coupled to Mohammedan symbolism.

In the same trend of thought we find that traditions furnish

evidence of a remarkably pointed character. One that flourishes to this day among Turks has it that their occupation of European territory could never be permanent. Often have I heard this voiced by Turks who simultaneously added by way of explanation that it could not be otherwise since they were Asiatics. It is this feeling which lies at the root of the Turk's unwillingness to be buried on the European side of the Bosporus or the Dardanelles. The same sentiment accounts for their relatively larger burying grounds all along the Asiatic shores bordering the peninsula, as compared to those on the European coast.

Additional proof of the common Altaic origin of the Balkan nationalities is derived from the domain of philology. To be sure the Bulgarian and Turkish languages, as spoken now, preclude attempt on the part of representatives of each nation to converse in their respective vernaculars with one another even though an insignificant number of Turkish words have crept into the Bulgarian in the course of the centuries during which the now victorious Slavs had been subjected by their conquered foe. These are mostly modern words, however, which did not exist at the time of the Asiatic migrations. On the other hand, lying deeper in their etymological bonds are the words for both wild and domestic animals which are very similar in the two languages. In the same way the old stock of words relating to agricultural or pastoral pursuits are very closely related in Turkish and Hungarian.

From the highways of ancient migrations let us now turn to trade routes of modern times. Eurasian waters washing former and present Turkish coasts north of Crete have been among the most widely traveled routes of commerce. In the sixth century B.C. Greek sailors were already accustomed to ply between the Ægean and Black Seas. The Argonauts may be considered early forerunners of the Italian navigators of the twelfth, thirteenth and fourteenth centuries whose ventures in the Levant contributed enormously to the wealth of Venice and Genoa. By that time conveyance of merchandise between Europe and Asia depended largely on maritime transportation between commercial harbors of the Adriatic and caravan terminals on the Black Sea. In the Hellespont, the Marmora and the Bosporus, this route was entirely controlled by the masters of the southeastern section of the Balkan Peninsula. To what extent vessels were at the mercy of the owners of the straits is shown by the fact that the final conquest of the peninsula by the Ottomans dealt a death blow to the trade directed along this channel. It is a fact of the greatest interest that the

events which led to the capture of Constantinople by the Turks, in 1453, diverted the attention of seamen to westerly routes. The discovery of the new continent was consequently accelerated, as a result of the enforced search for an occidental passage to India in order to allow reconstitution of the trade lost through the successes of Ottoman arms.

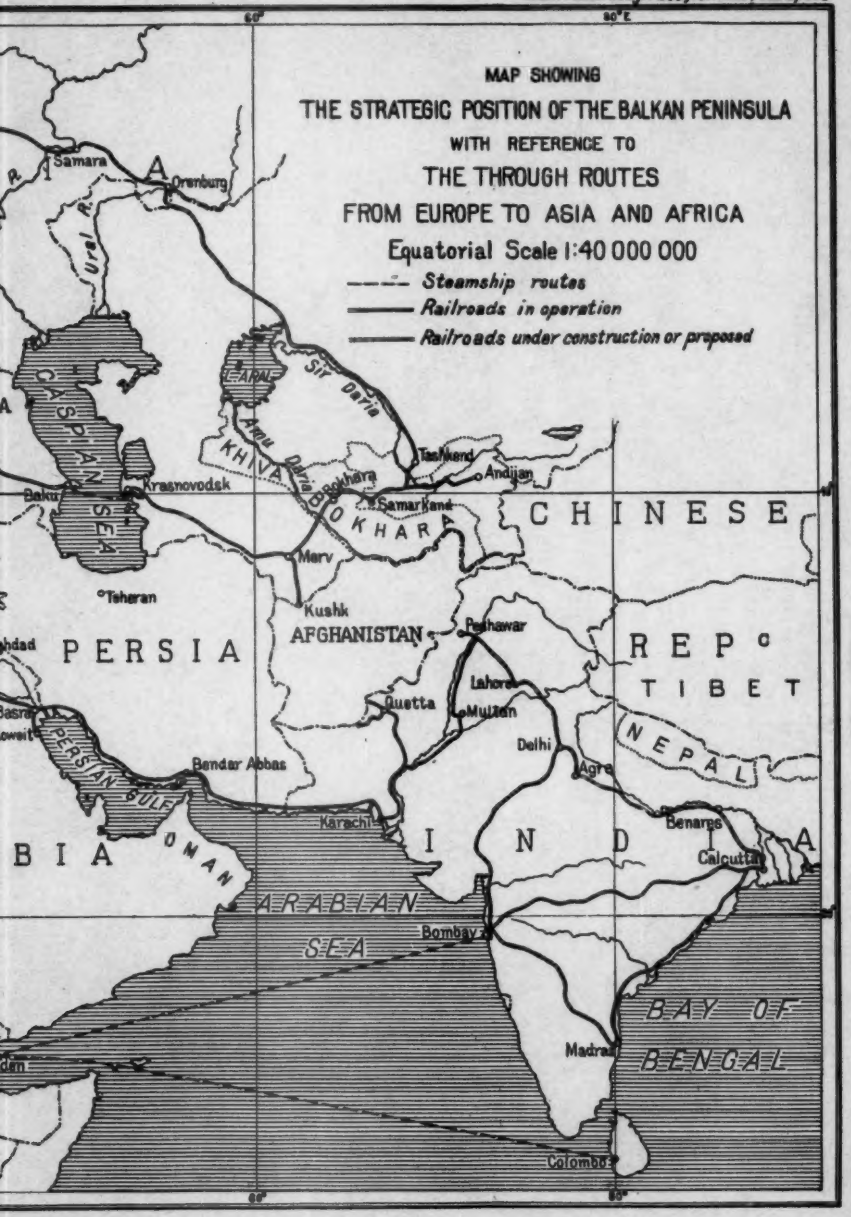
In the present era of world-wide industrial expansion, events in the Balkans are largely shaped by strictly geographical factors with the result that the region fully retains its place as one of the most notable of international highways. So centrally is the peninsula situated with reference to Europe, Asia and Africa that its valleys afford the most convenient overland passage for the products of European ingenuity and science on their way to be marketed in the populous centers of consumption found in the other two continents. Even the air-line connecting Central Europe and India overhangs the Balkans. The superiority of the Mediterranean-Red Sea route over other avenues of traffic leading from the west to the east resulted in the construction of the Suez Canal. The advantages of this line of way still subsist. With the march of events, however, the main commercial thoroughfare from Europe to the Orient is shifting gradually from the waters between the Eurasian and African continents to a more easterly and at the same time far speedier overland route. The tracks of the Oriental, Anatolian and Baghdad railroad companies form at present the northern section of the trunk of this system. I have described it elsewhere.[3] Incidentally it should be noted that nature's provision for this world route is so well marked in the Balkan Peninsula that the luxurious cars of the Orient Express roll over a steel-clad path which coincides remarkably well, for the most part, with the trail followed by the first crusade—the one which Godfrey de Bouillon led along a path marked by nature.[4] The prolongation of these railroads to Delhi and the shores of the Indian Ocean by junction with the railroads of British India advancing toward the northwest is now economically desirable.

Through connection with the Cape of Good Hope by way of Maan and the Egyptian frontier, over the Sinai Peninsula and the Cape to Cairo line, will probably be exacted by the require-

[3] The Railway Situation in Turkey. *Cassier's Magazine*, July, 1911, pp. 195–205.

[4] Such natural paths are in reality roads of easiest travel and occur in various parts of the world. The Old Santa Fé Trail affords an excellent instance of one of the most notable ones in America. Here the trader's ponderous wagon was driven with astonishing accuracy in the first half of the XIXth century over the trail which Spanish friars and cavaliers had trampled some three centuries earlier, while exploring the regions beyond the present northern confines of Mexico.


NORTH SEA
BALTIC SEA
GERMANY
Berlin
London
Calais
Paris
FRANCE
Munich
Vienna
Budapest
AUSTRIA
HUNGARY
SWITZERLAND
Lyons
Marseilles
ITALY
Brindisi
Belgrade
SERVIA
BULGARIA
RUMANIA
TURKEY
Constantinople
GREECE
MEDITERRANEAN SEA
ALGERIA
TUNIS
LIBYA
Alexandria
Afium Karahissar
Konia
Smyrna
Aleppo
Mosul
Beirut
Damascus
Pt. Said
Maan
Baghdad
Basra
Kuweit
PERSIA
Cairo
EGYPT
Assuan
Wady-Halfa
Suakin
Berber
Khartum
El Obeid
Medina
Mecca
Jedda
ARABIA
YEMEN
Aden
ABYSSINIA
RED SEA
Moscow
RUSSIA
Samara
Dnieper R.
Don R.
Volga R.
Ural R.
CAUCASIA
CASPIAN SEA
Batum
Baku
BLACK SEA
Bucharest
Constanza
Danube R.
Morava R.
Nish
Sofia
Philippopolis
Adrianople
Vardar R.
Salonica
Dede Agach
Sea of Marmora
Eskishehir
Kutahia
AEGEAN SEA
Athens
MACEDONIA
EPIRUS
BALKAN PENINSULA
++++ route of the First Crusade 1096–1099
20°
40°


MAP SHOWING
THE STRATEGIC POSITION OF THE BALKAN PENINSULA
WITH REFERENCE TO
THE THROUGH ROUTES
FROM EUROPE TO ASIA AND AFRICA
Equatorial Scale 1:40 000 000
Steamship routes
Railroads in operation
Railroads under construction or proposed
60°
80°E
Samara
Orenburg
Ural R.
CASPIAN SEA
ARAL
Sir Daria
Amu Daria
KHIVA
Bokhara
Tashkend
Andijan
Samarkand
BOKHARA
Krasnovodsk
Baku
Merv
Teheran
Kushk
AFGHANISTAN
Peshawar
PERSIA
CHINESE
REPᴳ
TIBET
Lahore
Multan
Quetta
Delhi
Agra
NEPAL
Bender Abbas
PERSIAN GULF
OMAN
Karachi
Benares
Calcutta
INDIA
ARABIAN SEA
Bombay
BAY OF BENGAL
Madras
Colombo
60°
80°

ments of trade. In that case railroad ferries over the Bosporus will enable the same car to be hauled directly from the coast of the Baltic Sea to the shores of the Indian Ocean or to cities built at the southernmost points of Africa. There is reason to believe, however, that even the fording of the Bosporus will be accomplished by means of a bridge built over the half mile of sea separating the European and Asiatic fortresses which face each other at Rumeli Hissar. Such a bridge would be shorter than the Brooklyn Bridge.[5]

It is not my intention to dwell on political considerations; nevertheless, I cannot refrain from laying stress here on the fact that geography, above all, is stamping its impress on the political status of the modern inhabitants of the Balkan Peninsula. We have just seen how this region forms a section of a great international commercial route. Coupling this fact with industrial requirements which find expression in the demand for unhampered right-of-way for products of toil and thought in transit to selling localities, it can be conceived how great European powers keenly desire to secure control, or at least maintenance, of equal rights of passage over an avenue so happily situated. The matter is vital because it is based on economic grounds. American producers accustomed to rely largely on home consumption for the disposal of the output of their factories sometimes fail to realize how imperatively the creation of markets beyond national frontiers is forced upon European owners of industrial plants. Continued operation or shut-down of many Old World factories often depends nowadays on diplomatic efficiency. Nowhere is this state of affairs better in evidence than on the site of that battle royal of diplomacy known by the name of the Eastern Question. The matter of Servia's access to the Adriatic or the withholding of Austria's acquiescence to Montenegrin occupation of Scutari must therefore be ultimately explained by the geographical causes which have converted the peninsula into a highway of such importance that the paramount influence of a single nation over its extension cannot be tolerated by the others.

As matters stand at present the balance of power oscillates between two groups represented by Teutonic and Slavonic elements respectively. Their clashing Zone is the Balkan Peninsula. The "Drang nach Osten" of Pan-Germanism found concrete geographical expression on the map in 1908 by Austria's final absorption of Bosnia and Herzegovina. A further step in the same

[5] The Brooklyn Bridge is 6,537 feet long and has a river span of 1,595 feet.

direction will probably be marked by the creation of a new Balkan nation—Albania. All this as a result of efforts to obtain control of the remarkable highway we have been considering. Facing this easterly spread is the steady southerly progress made by the Balkan countries. Each one of their recent victories lengthened perceptibly Russia's southwesterly strides toward ice-free coasts. The process taken as a whole is one of recurrence. Time has converted the stream of early Asiatic invaders into these two opposing currents. The Teutons are now repeating the exploits of the Greeks, the Macedonians, the Byzantines and the Crusaders. The Slavs, whose differentiation from Altaic ancestors has not been as thorough as that of their western neighbors, are likewise playing anew the part of their forefathers seeking milder regions by way of the Balkan Peninsula.

Out of the maze of tangled Balkan conflicts a single fact of sound geographical inference looms vividly in the shape of insured integrity of national existence for each of the nations in the peninsula. The preservation of a political *status quo* has been universally sought to avoid predominance over the Balkan regions on the part of any one of the great powers. Sultans have been allowed to rule in Europe for the last hundred years merely on account of the important thoroughfare crossing their dominion. To-day Bulgarians, Servians, Greeks, Albanians and even Roumanians may look forward with satisfaction to prolonged national entity by mere reference to advantages conferred by geographical factors. The spectacle of " mohajirs " trekking back pathetically to Asia in wooden-wheeled bullock-carts should not cause as much rejoicing in Balkan hearts as the sound of the locomotive whistle proclaiming life, freedom and prosperity along the old highway.

GEOGRAPHICAL INFLUENCES IN THE DEVELOPMENT OF WISCONSIN *

By MARY DOPP

Teacher of Physiography in the Francis W. Parker High School of Chicago

CHAPTER III. THE SETTLEMENT OF WISCONSIN

An effort has been made to give the salient points of the geography and geology of Wisconsin and to show how these conditions affected the Indian fur trade and the early exploration of the state. The discussion now aims to show how physical conditions influenced the distribution and activities of the settlers.

Previous to 1822 Green Bay and Prairie du Chien were the only places in Wisconsin with a sufficiently large white population to appear on the population maps of the Federal Census (Figs. 6 and 7). The settlement of Wisconsin by Americans began in 1822 in the southwestern part of the state. Col. James Johnson and a small party of men under the protection of troops sent out by the War Department took possession of the lead district. "A very few persons, probably not more than twenty, spent the ensuing

* Continued from pp. 401–412 and 490–499.

winter at Galena."[1] In August, 1823, the population of the lead region was 74 persons—men, women, and children—of whom a number were negroes. The fame of the upper Mississippi lead mines spread throughout the country. The desire for easily acquired wealth, the love of adventure, and the spirit of migration took possession of the people, and there was a rush of immigration to this region. The miners came from Virginia, Kentucky, Tennessee, Missouri, and Illinois. The first comers did not have in

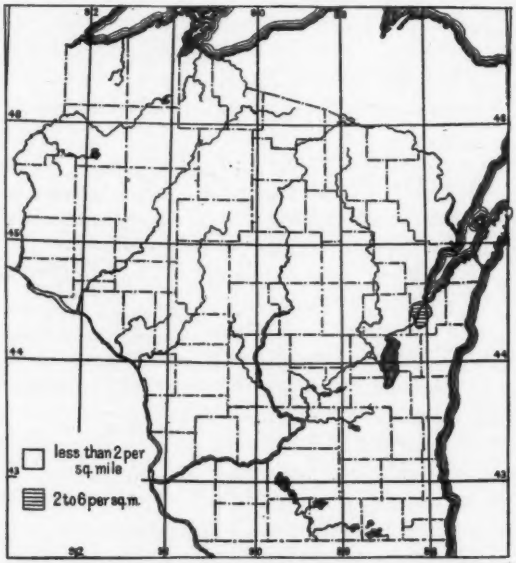


FIG. 6—Distribution of Population in 1790. Scale, 1:6,000,000.

view the acquisition of land and the making of homes. Most of them were not even professional miners. Many came in the spring by way of the Mississippi River or overland by wagon or stage, and went away again in the autumn. This migratory habit caused them to be named "Suckers," after a fish which inhabits the waters of this region. Some of these adventurers worked together in pairs as partners. They would provide a habitation for themselves by digging a hole in the side of a hill large enough for two to sleep and cook their meals in, thus earning the name of "Badgers."[2]

[1] Strong, M. M.: History of Wisconsin Territory, p. 117.

[2] *Wis. State Hist. Proc.*, 1907, p. 304. From a letter by M. M. Strong to the *Madison State Journal*, Dec. 10, 1879.

In 1827, Cornishmen began to arrive in the lead region.[3] The decline of mining at home made them look elsewhere for a livelihood, and the glowing accounts of the upper Mississippi lead mines attracted them to this district. The estimated population of the mining region in 1825 was 200; in 1826, 1,000; in 1827, 4,000; and in 1828, 10,000.[4] Some of the settlements which were started at that time were Hazel Green, New Diggins, Cassville, Gratiot,

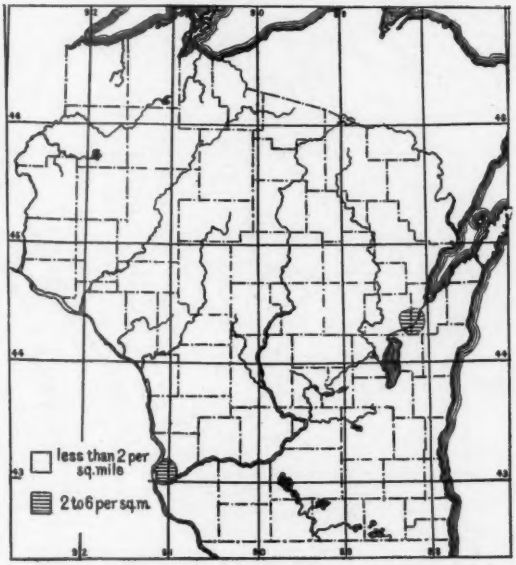


FIG. 7—Distribution of Population in 1800. Scale, 1:6,000,000.

Platteville, Mineral Point, Dodgeville, Blue Mounds, and Lancaster (Fig. 8).

The encroachments of the whites on what the Indians regarded as their property created great bitterness of feeling among the savages, which resulted in the Indian disturbance of 1827, known as the Winnebago War. Peace was restored very shortly, but was broken again in 1832 by Black Hawk's War. Black Hawk was captured August 27, 1832. Thereupon the Indians agreed to move to the west side of the Mississippi River, and what is now the state of Wisconsin has not since been the scene of Indian troubles.

[3] Thwaites, R. G.: Wisconsin, p. 201.
[4] Strong, M. M.: History of Wisconsin Territory, p. 117.

Following the disbanding of the army engaged in the Indian wars there came a great increase in settlement, largely agricultural, in southern Wisconsin. The causes of the increased migration were various. (1) The lead miners were anxious to obtain provisions at reasonable prices, and they encouraged the immigration of farmers by advertising the agricultural possibilities of the region. (2) The soldiers who served in the Winnebago and Black Hawk Wars were so pleased by the beauty, fertility, and climate

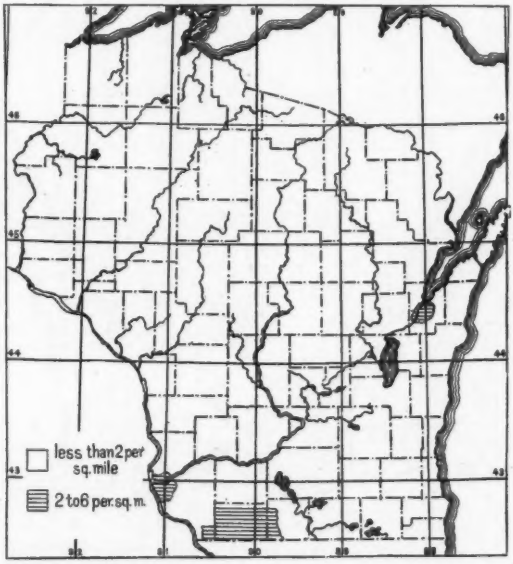


FIG. 8—Distribution of Population in 1830. Scale, 1:6,000,000.

of the country that many of them settled there, and their accounts of the region brought many others. (3) The settling of the Indian troubles and the removal of the savages across the Mississippi brought the region into good repute with the peaceably inclined. (4) The low price of land, $1.25 an acre, made it profitable for farmers to sell their land in older settled districts and move where they could get more and better land for their money. (5) The time and cost of travel to the West had been reduced greatly by the completion of the Erie Canal in 1825, and by the use of steamboats on Lake Michigan. The first steamer appeared on the lake in 1826, and the number increased rapidly after 1835. (6) The panic

of 1837 checked for a time the immigration from the East, but later increased it, because many of the factories in the East were compelled to close, and their hands came west. (7) The importation of merino sheep and the protective tariffs of 1824 and 1828 encouraged the wool industry in the East. The hill lands were bought by moneyed men for sheep raising at a price that the poor farmer could not afford to refuse. (8) Irish immigrants displaced

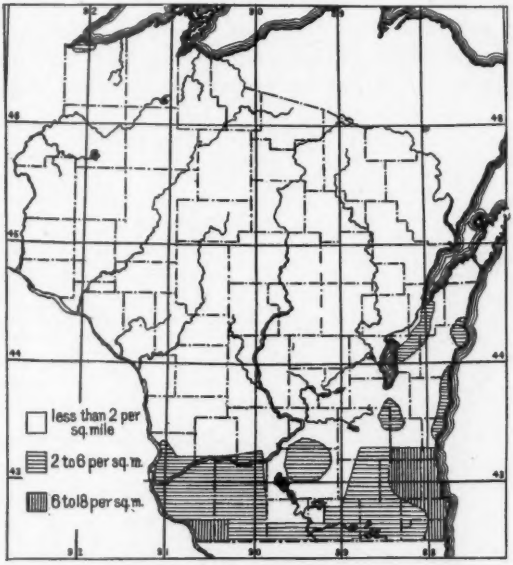


FIG. 9—Distribution of Population in 1840. Scale, 1:6,000,000.

the New Englanders as mill workers in many of the eastern factories, and the displaced factory hands migrated.

The great bulk of the immigration to Wisconsin came in at the lake ports and naturally settled in the eastern and southeastern parts of the state (Figs. 9 and 10). In May, 1838, the census gave Wisconsin a population of 18,149.[5] The Federal Census of 1840 showed a population of 30,945.

" With the exception of some private land claims at and near Green Bay and Prairie du Chien, which had been confirmed by the general government, none of the public lands within the limits of

[5] Strong, M. M.: History of Wisconsin Territory, p. 268.

Wisconsin had previous to 1834 been disposed of."[5] June 26, 1834, by an act of Congress, the area south of the Fox-Wisconsin Rivers and north of the Illinois boundary was divided into two land districts. The Green Bay district extended from Lake Michigan to a north-south line just west of Fort Winnebago, and the Wisconsin district from this line to the Mississippi. Some of the public land had been surveyed previous to 1834, and after that date the survey was carried on rapidly, so that presently the ownership of the land passed from the government to private individuals and settlement extended in all directions. The first public sale of land was held at the Mineral Point land office November 10, 1834. The first sales at the Green Bay office occurred August 17 and 31, 1835.

LAND SOLD IN WISCONSIN TO 1843[6].

Year	Acres	Value
1835	217,543.91	$316,709.07
1836	646,133.73	808,932.32
1837	178,783.45	223,479.45
1838	87,256.31	109,416.14
1839	650,722.82	819,909.90
1840	127,798.34	159,848.48
1841	101,731.17	127,446.31
1842[7]	88,929.11	113,755.39
1842[8]	200,000.00[9]	250,000.00[9]
	2,298,898.84	$2,929,497.06

The location of the homes of the immigrants was determined by several considerations. The deciding influence in many cases was nearness to (1) a navigable stream or a highway, (2) market, (3) the site of a projected town, (4) neighbors, or (5) water and wood supply. (6) With a few the opportunity to combine mining with farming was the controlling factor.

(1) The influence of navigable streams upon the distribution of population is shown in the early settlement of Beloit, Janesville, Fort Atkinson, Watertown, and Hustisford on the Rock; Packwaukee, Berlin, and Omro on the Fox; and Oshkosh, Winneconne, and Shawano on the Wolf. In many such cases, waterpower was available for running grist mills and saw mills. The influence of rivers on settlement is shown, too, in the distribution of population along the Mississippi, Chippewa, and Wisconsin Rivers in 1850 (Fig. 10).

[5] Strong, M. M.: History of Wisconsin Territory, p. 268.
[6] Lapham, I.: Wisconsin, p. 32.
[7] Jan. 1 to Sept. 30.
[8] Oct. 1 to Dec. 31.
[9] Estimated.

The roads of the state were of great importance in distributing the agricultural population. In 1824 what was probably the first road in the state was laid out along the east side of Fox River from Green Bay to Kaukauna and was paid for by private subscription.[10] In 1833 a government road was begun between Green Bay and Prairie du Chien (Fig. 11). It passed through the present towns of Depere, Calumet, Fond du Lac, Portage, along the crest of Military Ridge to the Mississippi, and then to Prairie

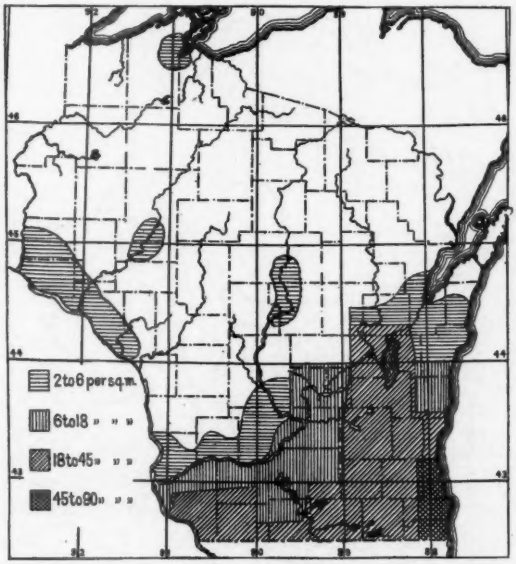


FIG. 10—Distribution of Population in 1850. Scale, 1:6,000,000.

du Chien.[11] This road was not open for travel until 1835. In 1834 the territory of Michigan established a road from Milwaukee to the Mississippi by way of the Platte Mounds, and in 1835 extensions were built from Milwaukee to Lake Winnebago, and from the Blue Mounds to the state line in the direction of Chicago. The road which extended from the lead region through Blue Mounds to Madison was known as the Blue Mounds Road and became one of the chief thoroughfares of the territory. It was over this road

[10] Thwaites, R. G.: Wisconsin, p. 250.
[11] Matteson, C. S.: History of Wisconsin, p. 171.

that the caravans from the lead country drew their loads to Milwaukee to be shipped east, and over it they returned with supplies and immigrants for the interior of the state. By 1840 Prairie du Chien, the towns of the lead region, Green Bay, and the Lake Michigan towns were connected by roads with the interior towns of Beloit, Janesville, and Madison, and with each other. The first road to be built north and west of the Fox-Wisconsin Rivers was

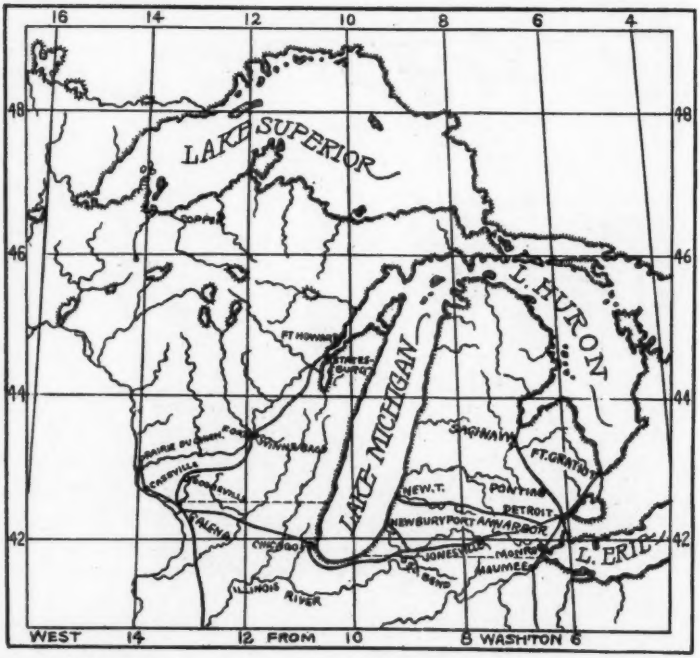


FIG. 11—Michigan Territory in 1832. Scale, 1:10,000,000. From Robt. Baird: View of the Mississippi.

begun in 1843, and was to extend from Prairie du Chien to Chequamegon Bay by way of the Black and Chippewa Rivers.[12] As settlement progressed more roads were laid out, and in 1851, when the first piece of railroad in the state was finished between Milwaukee and Waukesha, there was a network of wagon roads over the southern part of Wisconsin (Fig. 12). The early roads of the state

[12] Thwaites, R. G.: Wisconsin, p. 251.

were the widened and straightened trails of the Indians, and for years they were in wretched condition during the wet season.

(2) Nearness to market was an important consideration in determining the place of settlement. The population map of 1840 (Fig. 9) shows this clearly. The lake shore towns and Madison

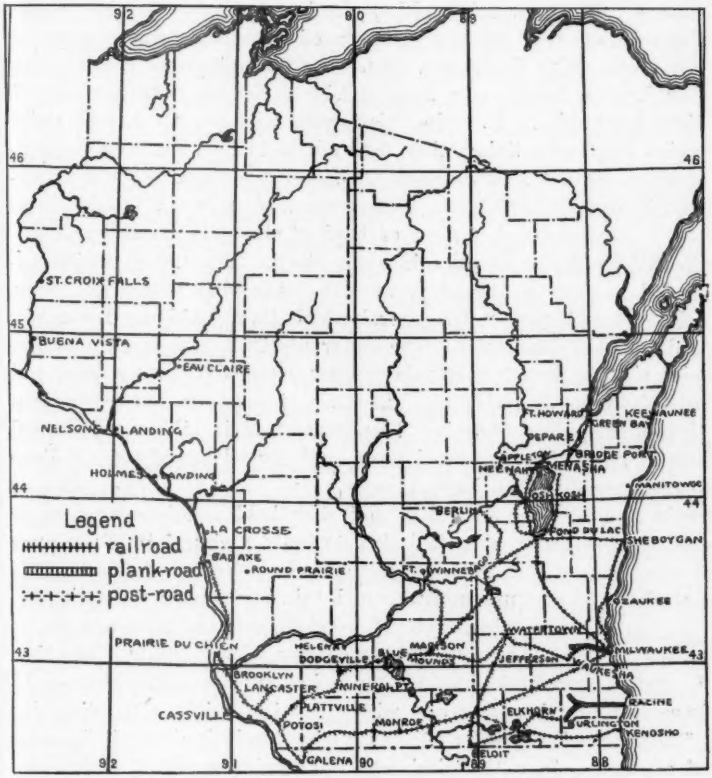


FIG. 12—Road Map of Wisconsin in 1851. Scale, 1:4,500,000.

were surrounded by a circle of settlement. The influence of Milwaukee, Racine, and Kenosha extended for some distance inland, and the influence of the mining region is apparent.

(3) The control of what the settlers believed to be the site of a future town is illustrated in the case of Madison. "In 1836 the land around the Four Lakes was taken, each buyer hoping the

capital would be located in his neighborhood.'' [13] Land was chosen with little regard for quality, which was in general a wise move. However, the average value of farm land near Madison is not now as high as in some of the townships farther removed from market.

(4) The character and nearness of neighbors were matters which were frequently of the utmost importance in locating newcomers. Often several families, who had known each other in the East, settled close together and formed a community similar to the one from which they came. Such a community was Beloit. The founders of Beloit came from Colebrook, in the northern part of New Hampshire. Becoming dissatisfied with the conditions under which they were living, they determined to look for larger opportunities. The ''New England Emigrating Company'' was organized in October, 1836, and sent agents west to find a suitable location. They secured a tract of land at the state boundary where the Turtle River empties into the Rock. The things which appealed to them at this place were the high bluff where the rivers join, the waterpower, the gravel which they could use for roads, and the abundant game. The emigrants from Colebrook, together with six families from southern New Hampshire, came west and settled on the site selected. The name of the town was a combination of Belle and Detroit. They platted their village with broad streets like a New England town, and named one street ''College Street'' before they knew they were to have a college. One of their number was a deacon, and they held religious services at their houses before they had time to build a church.[14] They were a selected group of men and women who were able to make good use of the many opportunities which this new country offered.

(5) The available supply of wood, water, and wild hay determined the location of many new homes. Immigrants from New England, New York, and England chose places where they could have both prairie and woods, with water if possible. The difficulty of digging wells on some of the prairies, the lack of wood, the need of protection from the wind, and the toughness of the prairie sod discouraged settlement there for a time. The high price of wheat in the early fifties made this land so desirable that it was finally all taken up.[15] The oak openings, on the other hand, had neither the objections of the prairie nor those of the heavily wooded areas.

[13] Hibbard, B. H.: History of Agriculture in Dane County, *Bull. Univ. Wisconsin*, No. 101, p. 106.

[14] Whitney, H. M.: The Settlement of Beloit, *Wis. Hist. Soc. Proc.*, 1898, p. 134.

[15] Hibbard, B. H.: History of Agriculture in Dane County, *Bull. Univ. Wisconsin*, No. 101, p. 109.

There was plenty of wood, the stumps were removed easily, there was usually water to be had without great inconvenience and the ground was loose and easy to break. Many Germans and Norwegians settled on the hilly land, perhaps because they were accustomed to it at home.[16] Most foreigners were afraid of wind storms and avoided the open. The settlers from the Mississippi Valley states were not afraid of the prairies because they had had some experience with them, and realized the relative ease of obtaining returns from a soil unencumbered with timber and brush.

(6) The opportunity of combining mining with farming located many of the Cornishmen, who came about this time, in the lead region.

Previous to this wave of agricultural immigration the history of Wisconsin had been largely dependent upon and controlled by its rivers as highways. Nearly all the people who traveled through this territory did so by its waterways. The few settlers at Green Bay and Prairie du Chien were located along the rivers. Now, however, the American pioneer was seeking good farm land and, although ease of communication was of great importance, many of the settlers were obliged to settle inland away from the river courses. In many cases the backwoodsman, having laid out his claim and built his log house, found that he was perhaps a hundred miles from a grist mill and twenty-five or thirty miles from the nearest post office, the only connection between him and his market being a mere trail.[17]

With the exception of a border of timber along Lake Michigan, the whole southern part of Wisconsin, besides a considerable strip along the Mississippi and St. Croix Rivers, was characterized by prairies and oak openings (Fig. 13). The prairies were small compared with many of those in Illinois. They were surrounded by woods, which furnished fuel and partial protection from the winds, and they were usually well watered by lakes and streams. Locally, however, all the water used was carried a distance of five miles or more until a well could be sunk.[18] The oak openings were very important features in southern Wisconsin. They were of two kinds—the black oak openings which belonged to the sandy regions and were relatively infertile, and the burr oak openings which were among the most productive portions of the wheat raising

[16] Hibbard, B. H.: History of Agriculture in Dane County, *Bull. Univ. Wisconsin*, 101, p. 108.
[17] Thwaites, R. G.: Wisconsin, p. 249.
[18] Hibbard, B. H.: History of Agriculture in Dane County, *Bull. Univ. Wisconsin*, No. 101, p. 109.

area.[19] The openings were groves of oaks scattered here and there over what would have been, except for them, a prairie country. Except fencing and fuel the openings furnished little of value in the way of timber.

The breaking of the prairie sod was difficult. Usually it was accomplished by means of a large plow which would cut a furrow

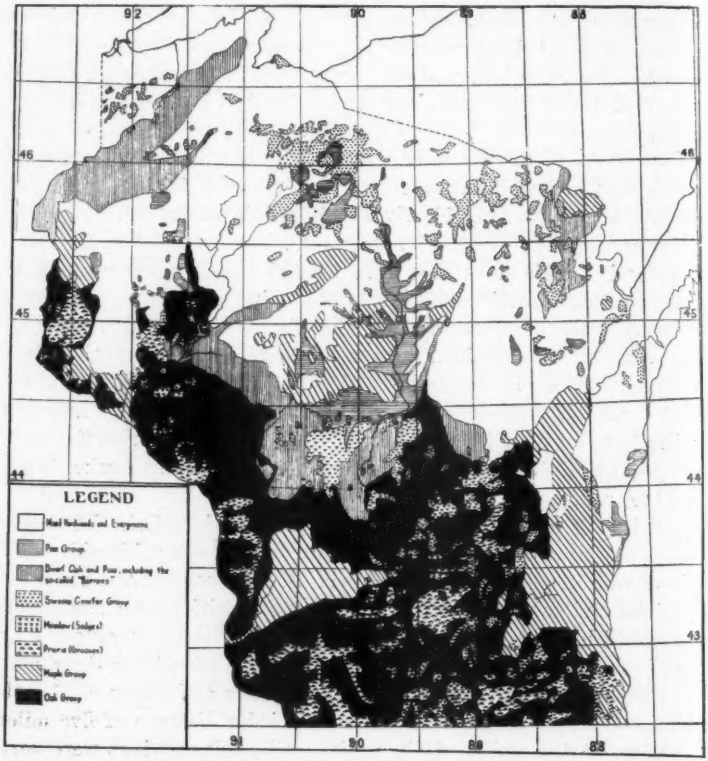


FIG. 13—General Map of the Native Vegetation of Wisconsin, from the Atlas of the Geological Survey of Wisconsin, Plate No. 11A. Scale, 1:4,500,000.

two feet wide and three to four inches deep. This was drawn by six yoke of oxen, such a team being able to turn three to four acres of prairie sod a day. The soil of the oak openings was plowed much more easily, and this made the openings greatly sought after as

[19] *Trans. Wis. State Agri. Soc.*, Vol. VI, 1860, p. 47.

places to settle. Sixty acres of prairie sod was the average amount for a man with a good plow and a team to reduce in a season. The preparation of timbered land was a much slower process. The trees were cut into suitable lengths, piled in convenient places and burned. If there happened to be a demand for potash in the nearest market, the ashes of the hardwoods could be made to produce some small income, but usually the timber was not only without value, but was a source of expense.

Besides the permanent settlers who came to Wisconsin many speculators bought large tracts of choice land, usually along the main thoroughfares, with the expectation of making a large profit by selling it to settlers willing to pay for a site along a highway. The result was that many settled away on the cross roads and intermediate tracts, and "there you will see many of the best farms and the finest improvements."[20] Buying of land for speculation occurred extensively before 1837, as shown by the fact that about 500,000 more acres were sold during 1835 and 1836 than in 1837 and 1838, although the population in 1838 was nearly double that of 1836. The decrease in speculation was probably due to the financial panic. Settlers who came in the years 1836, 1837, and 1838 avoided the counties where the land had been sold to non-residents and swarmed to the counties of Racine, Kenosha, Waukesha, Dodge, Jefferson, Walworth, and the eastern part of Rock and Columbia, where they had a choice of land. When this land was offered for sale in 1839 these "squatters" redeemed their "claims."

Some of the towns to be settled by this wave of immigration were Milwaukee, Racine, Kenosha, and Janesville in 1835, Beloit and Watertown in 1836, Madison in 1837, and Fond du Lac and Whitewater in 1839. In 1837 Congress established 15 new post routes in the territory, making a total of 35, and in June, 1838, there were 80 post offices in Wisconsin east of the Mississippi.[21]

About 1840 a strong foreign element appeared in the incoming tide of settlers. The Germans came first. It is not known when the first German came to Wisconsin, but the first one settled in Milwaukee County in 1835. During the summer of 1840 Milwaukee received 200 to 300 German immigrants a week. In the summers of 1843 and 1844 from 1,000 to 1,500 arrived each week. In the latter years they did not remain in Milwaukee in such large numbers as at first, but penetrated into the interior of the state.[22]

[20] Curtiss, D. S.: Western Portraiture, p. 137.
[21] Strong, M. M.: History of Wisconsin Territory, p. 264.
[22] Faust, A. B.: The German Element in the United States, Vol. I, p. 420.

The German immigration was greatest between 1846 and 1854 and between 1881 and 1884.

TABLE OF GERMAN-BORN POPULATION IN WISCONSIN.

Census	German-born	Percentage of Entire Population of State	Percentage of Foreign Population	Increase
1850	38,068	11.3	32.4	.....
1860	123,879	15.97	44.7	85,191
1870	162,314	15.39	45.0	38,425
1880	184,328	14.0	45.0	22,014
1885	265,756	16.99	53.8	71,428
				Decrease
1890	259,819	15.34	50.0	5,837
1900	242,777	11.68	47.05	17,042
1905	226,154	10.1	44.8	16,623

The causes of the German immigration to Wisconsin were economic, political, social, and geographical. The effort to convert Wisconsin into a German state centered the attention of the Germans upon it, and as it was thrown open for settlement at a time when a haven for political refugees was much in demand, it received a great number of well-educated, intelligent young men, who could no longer live in Germany. The climate suited the Germans. It is similar to that of their own country, and the products of the soil were such as they had raised at home for generations—wheat, rye, oats, barley, and garden vegetables. There was no lack of employment. A young man might, by working as a farm hand, or by doing other common labor, earn enough in a few seasons to buy a farm. The hard times in Germany, together with a disinclination to render military service, were in many cases an inducement to migrate. Those who had settled in Wisconsin were successful, and their letters and often their money, which had been sent home, brought friends who usually settled near them. Pamphlets and books were written on Wisconsin by Germans who had traveled through or were living in the state. Many of these articles came out before 1850, and to each one the state is indebted for a certain number of German settlers. When Wisconsin was admitted as a state there was no debt, as in Illinois, Indiana, and Michigan, and this fact, with the correspondingly low taxes, appealed strongly to the cautious foreigner. By the efforts of the German delegates sent from Milwaukee to the constitutional convention of Wisconsin, the constitution adopted by the state was liberal to foreigners, requiring but one year's residence for the privilege of voting. The state

sold its school lands early and at a low price, usually at $1.25 an acre, sometimes less in the poorer sections. Even the poorest immigrant could afford to buy, especially when much of the land was sold on credit. In 1852 Wisconsin had a state law providing for the appointment of a commissioner of immigration who should

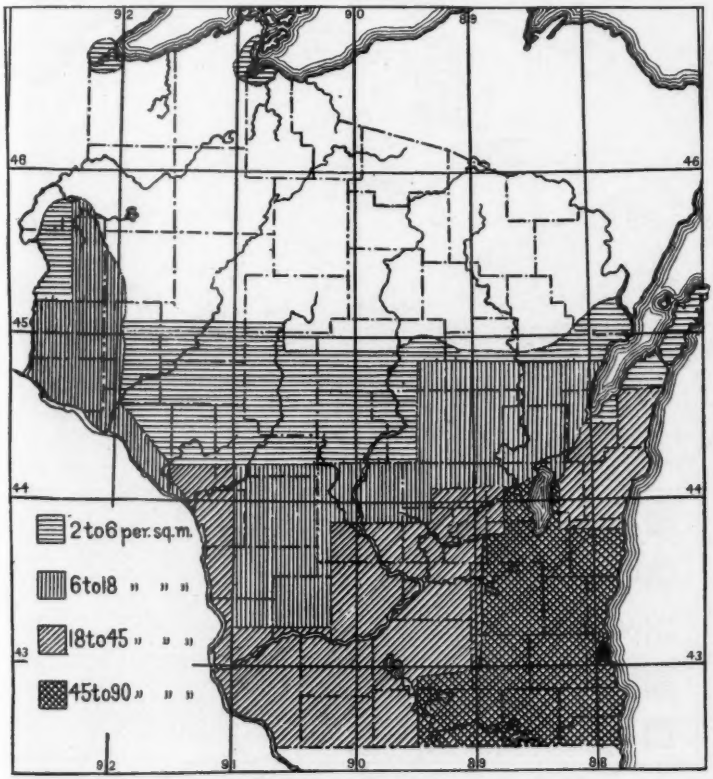


FIG. 14—Distribution of Population in 1860. Scale, 1:4,500,000.

reside in New York City during the year and whose business it was to furnish immigrants with information about Wisconsin.[23] The commissioner published pamphlets regarding the conditions in Wisconsin and had them distributed in Europe. He also advertised for settlers in selected German newspapers both in America and

[23] Faust, A. B.: The German Element in the United States, Vol. I, p. 476.

abroad. During eight months of the year 1853 the commissioner "received and answered 317 letters from Europe."[24] "Over 3,000 people visited his office, of whom two-thirds were Germans. Often money was sent to him from people in Wisconsin to assist friends and relatives on their arrival in New York."[24]

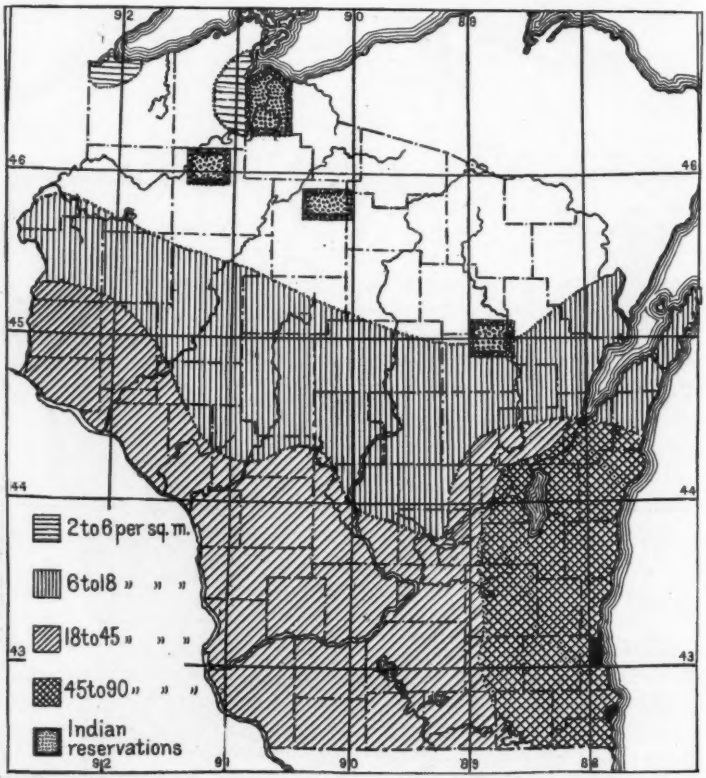


FIG. 15—Distribution of Population in 1870. Scale, 1:4,500,000.

The Germans settled in greatest numbers in the eastern and north central parts of the state, including Marathon and Shawano Counties, keeping to the heavily wooded area, as already noted. There is a large German population in Sauk and Buffalo Counties. Many Germans live, too, along the line of the Wisconsin Central Railroad to Lake Superior.

[24] Everest, K. A.: Wisconsin's German Element, *Wis. Hist. Coll.*, Vol. XII, p. 320.

Usually the immigrants came first to Milwaukee, which was the largest and best known Wisconsin port on Lake Michigan, and from there they went inland. As the counties near Milwaukee became filled they followed the timbered land north, penetrating Shawano County by means of the Wolf River, along which they

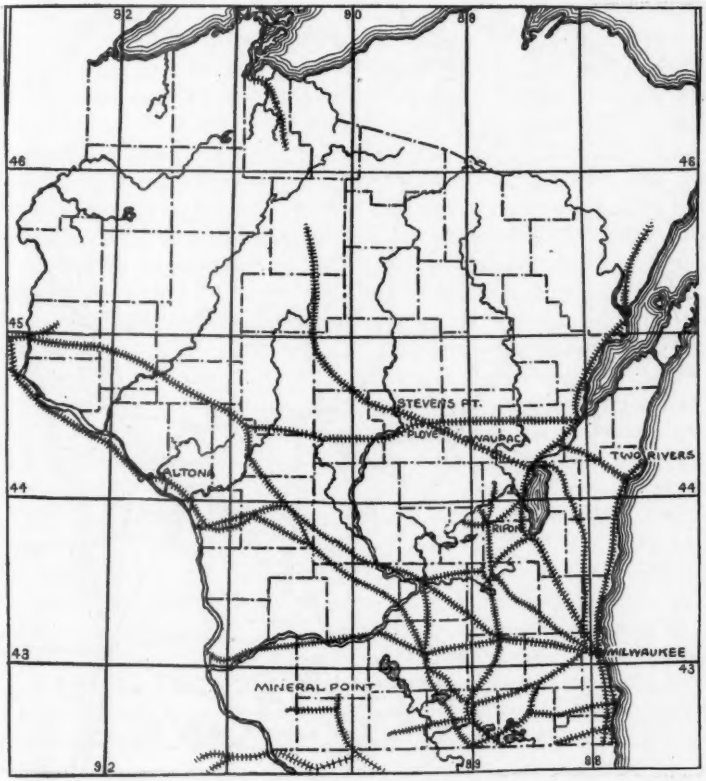


FIG. 16—Distribution of Railroads in 1873. Scale, 1:4,500,000.

made many settlements. The settling of Shawano County was helped also by the government roads which crossed it. There was the military road projected and partly finished from Green Bay to Ashland and another road connecting Shawano and Oshkosh.

Marathon and Lincoln Counties were settled first along the Wisconsin River. The settlements began long after the Wiscon-

sin Central Railroad was built through this region (Figs. 14 and 15).[25] With the completion of the Wisconsin Central Railroad to Lake Superior (Figs. 16 and 17) settlement advanced northward. The Wisconsin Central Company received a grant of land from the government which included every alternate section within twenty

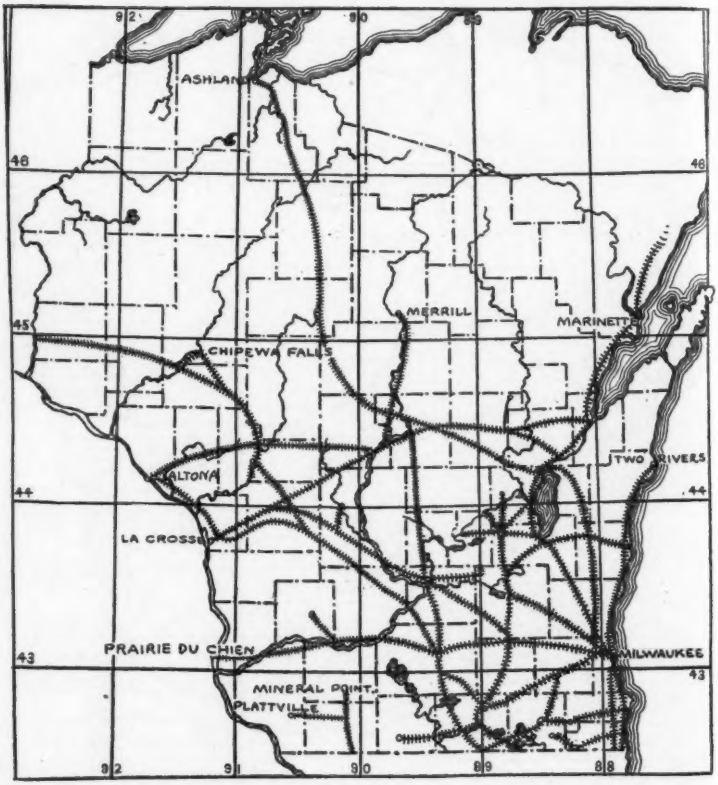


FIG. 17—Distribution of Railroads in 1880. Scale, 1:4,500,000.

miles of the right of way. The company sent an agent, who was also an agent for the state, to Europe to secure immigrants to settle along the line of the road. Some 5,000 people came, mostly from the forests of Bavaria. Cheap land, good wages in winter in

[25] The Wisconsin Central Railroad was built to Steven's Point in 1871, and finished to Ashland in 1877.

the lumber camps, and the fact that the sale of timber would often pay for the land on which it stood, were the inducements offered.

Sauk Prairie was settled by the Germans in 1840, Buffalo County in 1841. The Buffalo County settlement was started by some men who had been sent from Galena to cut wood for the passing steamboats on the Mississippi.

In due time the Germans were followed by other Europeans. There were Scandinavians (chiefly Norwegians), Bohemians, Poles, Dutch, Belgians, Swiss, people from the British Isles, and Canadians. Wisconsin is noted for the variety and solidarity of its groups of foreign-born people. These groups are made up not only of people of the same nationality, but from the same district or town, and people who were neighbors in Europe may be neighbors in Wisconsin. This shows that the immigration movement was not a matter of individual restlessness and desire for adventure, but was due to economic or political conditions which impelled whole groups of people to move in a body from their homes and form new communities. This type of movement is exemplified by the Swiss colony of New Glarus as well as by any other foreign group in Wisconsin. Stagnation in business and the partial crop failure of 1845 caused great distress among the poor classes in the canton of Glarus, Switzerland. A movement looking to migration was started, money was appropriated by the government, this fund was increased by private subscription, and two men were sent to America in search of a new home. They purchased in the northern part of Green County a 1,200 acre tract of land in one body and a detached 80 acres of timber. Of the 193 persons who started from Switzerland, 108 settled upon the land selected for them and formed the colony of New Glarus, which became the nucleus of a large and exceptionally prosperous Swiss settlement.[26] There are several other Swiss settlements in the western part of Green County. Among themselves these people speak the German-Swiss dialect of their mother country. They have incorporated into the life of their communities the customs and industries of their old home. It was in this Swiss colony that the manufacture of American Swiss cheese was first started in Wisconsin.[27] There are also several groups of Swiss outside of Green County, notably in Buffalo, Pierce, Winnebago, and Fond du Lac Counties.[28]

"Previous to the year 1840 there were but six Norwegian set-

[26] Luchsinger, John: The Swiss Colony of New Glarus, *Wis. Hist. Coll.*, Vol. XIII, p. 416.
[27] See Chapter VII, in December *Bulletin*, under "Manufacture of Swiss Cheese."
[28] Legler, H. E.: Leading Events in Wisconsin History, p. 208.

tlements in North America, and of these, three were located in Wisconsin. The first Norwegian settlement in Wisconsin was the fourth in America.'' [29] It was at Jefferson Prairie, Rock County. The next Norwegian settlement (1839) was the Muskego settlement in southern Waukesha and northern Racine Counties. These people were induced to migrate by encouraging reports from the Jefferson colony. In 1840 the sixth Norwegian settlement in America and the third in Wisconsin was planted at Koshkonong. It is said to be the largest and wealthiest community of Norwegian farmers on the continent.[30] There are large Norwegian settlements in Portage, Pierce, Waupaca, Winnebago, Dane, and Vernon Counties. Icelanders occupy Washington Island in Green Bay.

There are several important Polish communities in the state. The fourteenth ward in Milwaukee is almost solidly Polish, and there are large numbers in other wards of the city. There are Polish groups in Beaver Dam, Berlin, Steven's Point, and also in other parts of the state.[28]

The northern part of Wisconsin was settled much more slowly than the southern. This was due primarily to the impenetrability of the forests, the great difficulty of clearing the cut-over land of its pine stumps, the greater rigor of the climate, and general ignorance regarding the conditions of surface and soil. In 1848 almost the only settlements north and west of the Wisconsin River, except La Crosse, were a few lumber camps along the streams. How little was known of this region is indicated by the fact that ''in 1847 Mr. Thos. Owen, an eminent geologist, characterized it as a ' desert of sands, unapproachable by the agriculturalist.' '' [31] Some years later the ''Wisconsin Farmer'' stated that central and northern Wisconsin ''was an alternation of arid sand ridges and impassable marshes.'' [31]

La Crosse was settled in 1824 and was supported by an agricultural population attracted by the fertile prairie surrounding it, and by the lumber business, to which it fell heir by virtue of its position at the mouths of the La Crosse and Black Rivers. Besides these natural advantages, it was selected as the Wisconsin terminus for the Milwaukee and Mississippi Railroad, which was finished to this point in 1859. Through La Crosse passed many of the emigrants going to Minnesota and the states farther west, as well as the east-bound produce sent from these states.

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[28] Legler, H. E., Leading Events in Wisconsin History, p. 208.
[29] *Ibid.*, p. 211. [30] *Ibid.*, p. 212.
[31] Wisconsin in Three Centuries, Vol. III, p. 29.

By 1860 settlement had reached the forested area, but had scarcely gone beyond its edge (Fig. 14). The census of 1860 gives the towns of Oconto, Steven's Point, Wausau, Black River Falls, Eau Claire, Chippewa Falls, Menominee, Durand, River Falls, Prescott, and Hudson, of which only Prescott and Hudson had a population of more than 1,000. West Superior, Ashland, Med-

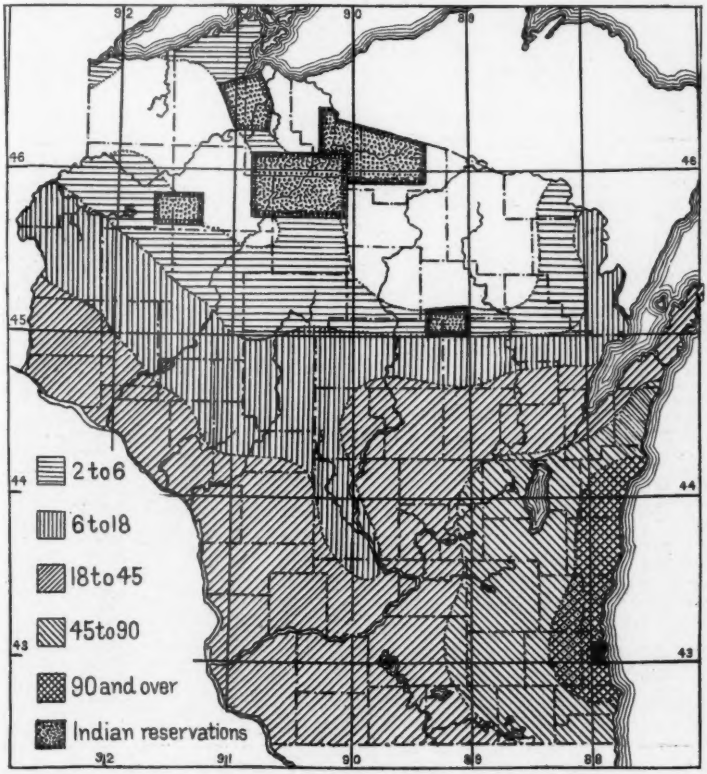

FIG. 18—Distribution of Population in 1880. Scale, 1:4,500,000.

ford, Phillips, Rhinelander, Antigo, Tomahawk, and Merrill were not then in existence.

So long as there were no railroads through the forest, settlements were made only near the rivers. How closely the distribution of population was controlled by the railroads is shown by the narrow zone of settlement along the line of the Wisconsin Central

Railroad in 1880 (Fig. 18). This railroad was not completed until 1877. West Superior had less than 1,000 inhabitants in 1882, when it was reached by the Northern Pacific Railway. In 1885 its population was 2,904. The railroad was continued to Ashland, and its route is marked by a band of settlement on the population map of

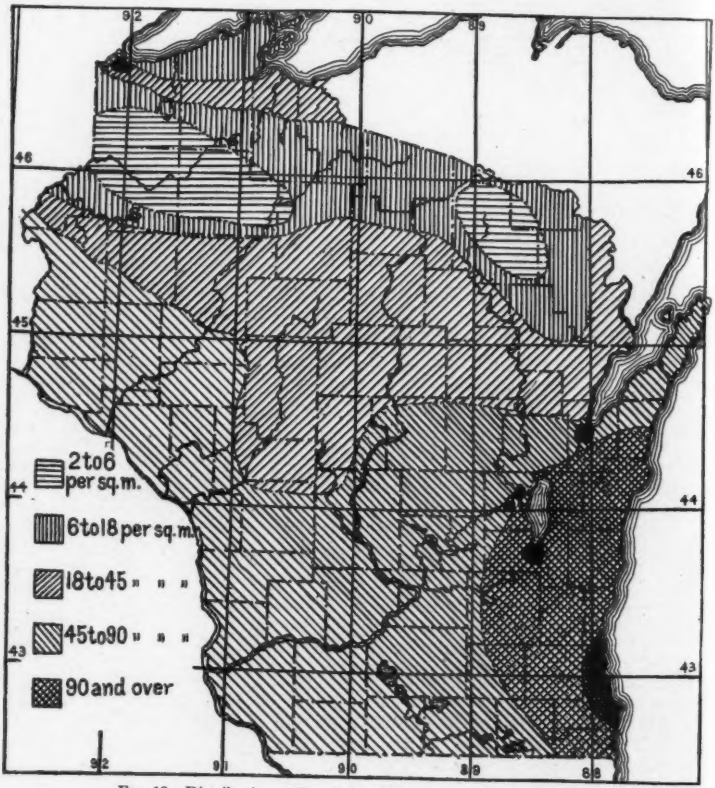

FIG. 19—Distribution of Population in 1890. Scale, 1:4,500,000.

1890 (Fig. 19). The prosperity of the towns that were built by the lumber industry naturally fluctuated with that business. Nearly all of these towns show a rapid increase of population between 1875 and 1885, when lumbering was at its height in Wisconsin (Fig. 20). After 1885 Eau Claire, Chippewa Falls, and Grand Rapids lost population. Grand Rapids recovered after 1890 because of manufacturing interests located there, but the two for-

mer have never since reached their high mark of 1885. Most of these lumbering towns had a decrease in the rate of growth, if not an actual decrease in population. Superior seems to be an excep-

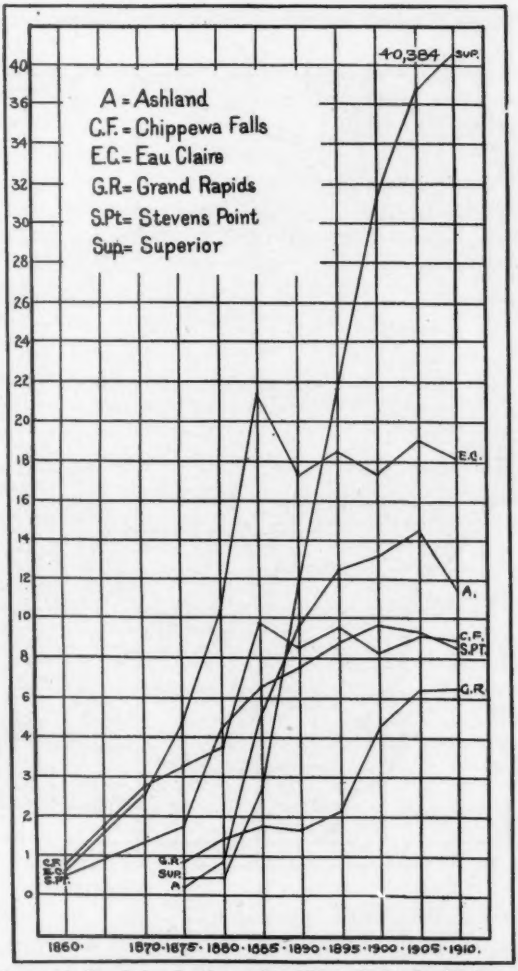

FIG. 20—Increase in Population (by thousands) of Towns in Lumber Region of Wisconsin.

tion to the rule, but it is only because Superior was not dependent upon lumber alone, but was supported by the grain from Minne-

sota and the Dakotas and the iron ore from Minnesota. By 1900 the state had everywhere a population of at least 2 to 6 to the square mile (Fig. 21).

The early immigrants came to Wisconsin chiefly by the waterways. Its location between the lakes and the Mississippi made the

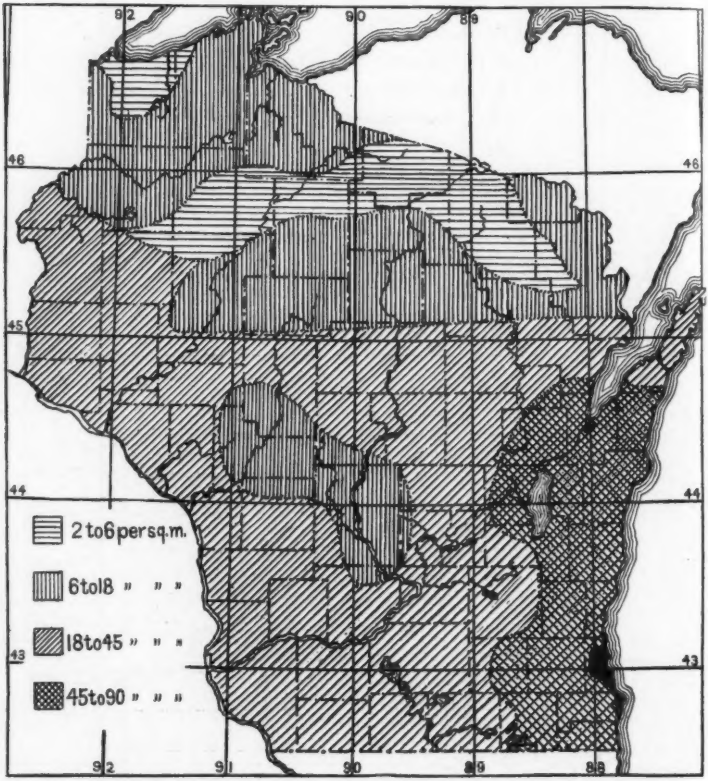

FIG. 21—Distribution of Population in 1900. Scale: 1:4,700,000.

state accessible both from the east and south. The lead miners came from the south by way of the Mississippi River or overland by wagon and stage from southern Illinois. Cornishmen, who began to appear in the lead region in 1827, did not pursue any stated course after leaving England by way of Penzance or Falmouth. Some came to New Orleans and then up the Mississippi River,

others came to New York, Philadelphia or Montreal. From New York and Montreal they went to Toledo or Cleveland by way of the Great Lakes, then across Ohio by canal to the Ohio River, and then to the Mississippi. No matter what route they followed, they all seemed to make St. Louis their first destination before going to the lead mines.[32]

The second wave of immigration came largely from the east. It was estimated that from 50,000 to 60,000 people were added to the population of the state in 1843 by way of the Great Lakes, and fully 10,000 more came in by the Mississippi.[33]

Emigrants from Vermont took stage or wagon to Whitehall, at the southern extremity of Lake Champlain, often taking with them their farming implements and live stock, besides their household goods. From Whitehall they went by boat on the Northern Canal to Troy, where they met other westward bound people from northern New England and New York.[34] Usually the Erie Canal was followed to Buffalo, although some went by stage. Buffalo was the place toward which all lines of travel to the West converged, because it was the point of departure for a line of steamers whose western terminus was Detroit, for a time the distributing point for Indiana, Illinois, and Wisconsin. From Detroit the emigrants took steamer or sailboat to Green Bay, Milwaukee, Chicago, or St. Joseph. Often there was not room on these boats for all the immigrants, and then a lumber wagon, covered with a canvas, a so-called "prairie schooner," was the conveyance in which they continued their journey across the peninsula of Michigan and around the end of the lake to Chicago.

Many came from the Middle States and from the older states west of the Appalachians, but if their destination was eastern Wisconsin they all passed through one or more of the distributing points of Detroit, Chicago, Milwaukee, or Green Bay, "where they formed caravans proceeding into the interior." [35]

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[32] Wisconsin in Three Centuries, Vol. III, p. 60.
[33] *Hunt's Merchant's Magazine*, Vol. X, June, 1884, p. 542.
[34] Thwaites, R. G.: Wisconsin, p. 246.
[35] *Ibid.*, p. 248.

(To be continued)

THE MAP OF THE ARCTIC REGIONS

A brief statement as to the origin and scope of the Map of the Arctic Regions, which accompanies separately this number of the *Bulletin*, may be made here.

The idea underlying the preparation of this map, which was suggested by Dr. H. C. Bumpus, former Director of the American Museum of Natural History, New York, was that it should be fitted over a globe 6 feet 7¾ inches in diameter, used for exhibition purposes by the Museum. This accounts for the introduction of the black gores at every tenth degree of longitude. Except for this, the map is on the equidistant azimuthal projection. The source material was mainly furnished by Mr. F. S. Dellenbaugh, former Librarian of this Society. The final revision, exclusive of the soundings, was undertaken by the Assistant Editor. The drafting was done by Mr. A. Briesemeister, map draftsman of the American Museum of Natural History. The map was printed by the firm of A. Hoen & Co., Lithographers, of Baltimore.

Aside from the attempted accuracy of its outline the chief claim of the map lies in its copious nomenclature. All names possible of delineation within the limits of the scale used have been included. Special care has been given to the transliteration of Russian names, which affect the whole Arctic coast from 32° E. to 170° W. In this, the rules published by the Royal Geographical Society (Hints to Travellers, 9th edition, 1906, Vol. II, p. 272) were followed.

It may be of interest to call attention to the delineation of certain regions, the sources for which are comparatively recent or not well known.

The region about the Eskimo Lakes (132° W.) near the mouth of the Mackenzie is taken from the surveys by A. H. Harrison, published in his "In Search of a Polar Continent" (see below, List of Arctic Maps, No. 11).

To the east, the rivers emptying into Franklin Bay (125° W.) are still shown as on previous maps, as the errors reported by Stefánsson were published too late to be incorporated. They refer mainly to the La Roncière and MacFarlane Rivers. These do not exist; they are replaced by a river called Horton River on Stefánsson's map (*Amer. Museum Journal*, Vol. 12, 1912-13, No. 6; incorporated on map in this *Bulletin*, Vol. 45, 1913, No. 2, facing p. 106) which empties into the Arctic Ocean between the head of Franklin Bay and Cape Bathurst.

The northern part of Baffin Island is based on the maps accompanying the reports published by Capt. Bernier (Nos. 7 and 8). His delineation is only general and tentative, as no surveys were made. Our lack of knowledge with regard to this largest island of the American Arctic Archipelago is well illustrated by the fact that, for the delineation of the eastern coast of the Fox Basin, we are still dependent on the Eskimo maps which were published in the narrative of Hall's second Arctic expedition (No. 15).

For the northeastern corner of Greenland the surveys of the Erichsen expedition have, of course, been used (No. 18). It was not possible, however, to incorporate this expedition's report of the non-connection of Peary Channel with Independence Bay, as the records bearing on this point were only recently made available through Mikkelsen (see July *Bulletin*, under "Greenland," p. 560) and Rasmussen. On the eastern side of Greenland, the coast of King Christian IX Land (between 67° and 70° N.) is based on Amdrup's surveys of 1898-1900 (No. 17).

On the Asiatic side of the Polar Basin the only region to which attention need be called is the Yamal, or Samoyede, Peninsula, to the west of the estuary of the Obi in 70° E. Here the recent surveys made on the expedition of the Russian Geographical Society in 1908 under the direction of B. M. Shitkow have been used. (See No. 26, below, and the *Bulletin*, Vol. 44, 1912, pp. 238–239 under "Siberia.")

A list of the principal maps used in the final revision is appended herewith. It should not be construed as an exhaustive bibliography; it is merely intended as a reference to some of the sources used and, as such, may prove suggestive.

List of Arctic Maps

1. Bathymetrical Chart of the North Polar Seas by F. Nansen. Pl. I, "The Bathymetrical Features of the North Polar Seas" by F. Nansen, Norwegian North Polar Expedition 1893–96: Scientific Results, Vol. IV, 1904.

2. Physical Chart of North Polar Regions. By J. G. Bartholomew. 1:14,000,000. 1897. Accompanies Vol. I of "Farthest North" by F. Nansen, 1897.

3. The Arctic Regions with the Tracks of Search Parties and the Progress of Discovery. 1896. 1:6,000,000. Hydrographic Office Chart No. 1531.

4. The Arctic Regions Showing Explorations towards the North Pole. [1:13,700,000.] Accompanies "Handbook of Polar Discoveries" by A. W. Greely, 5th edition, 1910.

5. Explorations in Northern Canada and Adjacent Portions of Greenland and Alaska. 1904. 1:5,200,000. Department of the Interior, Ottawa.

6. Map of Western Canada. 1910. 1:2,217,600. Department of the Interior, Ottawa.

7. Map of the Northeastern Part of the Dominion of Canada to illustrate the Report on the Cruise of the D.G.S. 'Arctic' to the Arctic Islands by Capt. J. E. Bernier, 1906–07. 1:3,168,000. Accompanies: Report of the Dominion of Canada Government Expedition to the Arctic Islands and the Hudson Strait on Board the D.G.S. 'Arctic', 1906–07, by J. E. Bernier. Ottawa, 1909.

8. Discoveries in the Arctic Sea with Additions and Changes to 1909 by Capt. J. Bernier. Equatorial scale 1:5,900,000. [Facsimile, with corrections, of British Admiralty Chart No. 2118.] Accompanies: Report of the Dominion of Canada Government Expedition to the Arctic Islands and Hudson Strait on Board the D.G.S. 'Arctic' by J. E. Bernier. Ottawa, 1910.

9. Map of Alaska compiled under the direction of R. U. Goode, Geographer, by E. C. Barnard and others. 1903. 1:2,500,000. Accompanies "The Geography and Geology of Alaska" by A. H. Brooks, *U. S. Geol. Survey Prof. Paper No. 45*, 1906.

10. Arctic Coast, Alaska. Equatorial scale 1:4,600,000. Coast and Geodetic Survey Chart No. 9400. 1911.

11. Survey of Part of the Mackenzie Delta and Adjacent Region by A. H. Harrison, 1905–07. 1:750,000. With insets of Baillie Is., 1:200,000, and Herschel I., 1:150,000. Accompanies "In Search of a Polar Continent, 1905–07" by Alfred H. Harrison, London, 1908.

12. Map of King Haakon VII Coast and Queen Maud's Sea and of Lieut. Hansen and Sergt. Ristveldt's Sledge Expedition, 1905. Compiled by Lieut. Hansen. 1:2,000,000. Accompanies Vol. II of "The Northwest Passage" by Roald Amundsen, 1908.

13. Polar Regions: Baffin Bay to Lincoln Sea. 1:1,400,000. Hydrographic Office Chart No. 2142. 1903.

14. Map Showing the Field of Work of the Second Norwegian Polar Expedition in the 'Fram,' Captain Sverdrup, 1898–1902, by Captain G. J. Isachsen. 1:2,000,000. Accompanies Vol. II of "New Land" by Otto Sverdrup, 1904.

15. (a) Sketch of Murray Maxwell Inlet. Drawn by Nood-loo, a native of Igloolik, May 11th, 1868. (b) Sketch of N. E. Coast of Fox Channel by the Innuit Oong-er-luk. Drawn May 23rd, 1868. Accompany, facing pp. 351 and 354, "Narrative of the Second Arctic Expedition made by Charles F. Hall," edited by J. E. Nourse, U. S. Naval Observatory, 1879.
Map (b) reproduced on p. 42 in "Baffin Land" by Franz Boas, *Ergänzungsheft No. 80 zu Petermanns Mitteilungen*, 1885.

16. Kort over Grönland udgivet af Commissionem for Ledelsen af de geologiske og geographiske Undersögelser i Grönland. 1:2,000,000. Kjöbenhavn. 1906.

17. (a) Grönlands Östkyst fra 65° 55′ til 68°10′ N. Br. Opmaalt af G. C. Amdrup. 1898–99 og 1900. 1:460,000. (b) Grönlands Östkyst fra 67°45′ til 69°25′ N. Br. Opmaalt af G. C. Amdrup. 1900. 1:460,000. Accompany, as Pls. VI and VII, respectively, "Carlsbergfondets Expedition til Öst-Grönland, udfört i Aarene 1898–1900 under Ledelse af G. Amdrup: Förste Del," *Meddelelser om Grönland*, Vol. 27, 1902.

18. (a) Nordöst-Grönland: Nordige Blad. 1:1,000,000. (b) Nordöst-Grönland: Sydlige Blad. 1:1,000,000. Accompany "Danmark-Ekspeditionens Kort" by J. P. Koch, *Geografisk Tidskrift*, Vol. 21, 1912, No. 5, pp. 167–177; also *Meddelelser om Grönland*, Vol. 46, 1912.
Same surveys incorporated in: North East Greenland: Sketch Map Showing the Surveys of the Danish Expedition 1906–08. 1:4,000,000. Accompanies "The Danish North-East Greenland Expedition" by A. Trolle, *Geographical Journal*, Vol. 30, 1909, pp. 40–65.

19. Arctic Ocean and Greenland Sea. Mean meridional scale 1:2,800,000. British Admiralty Chart No. 1129. Revised to 1901.

20. Map of the Arctic Coasts of the Russian Empire. 1:6,300,000. Chart No. 222. Chief Hydrographic Office, St. Petersburg, 1872. [In Russian.]

21. Carte de la Russie d'Europe en 16 feuilles. 1:2,000,000. Sheets 16 to 18. From Marcks's Atlas, edited by J. de Schokalsky, 2nd edition, 1910. [In Russian.]

22. Map of Asiatic Russia and Contiguous Territory. [1:4,270,000.] Sheets II, III, IV, IVa. Military Topographic Division, St. Petersburg, 1884. [In Russian.]

23. Map of the North Coast of the Old World from Norway to Behring's Straits with the Track of the *Vega* Expedition by M. Selander. Mean scale 1:4,000,000. Accompanies Vol. II of "The Voyage of the *Vega* round Asia and Europe" by A. E. Nordenskiöld (translated by A. Leslie). 1881.

24. Track of the *Fram* from August 26 to September 15, 1893. [1:3,700,000.] Plate VIII, "The Bathymetrical Features of the North Polar Seas" by F. Nansen, Norwegian North Polar Expedition 1893–96: Scientific Results, Vol. IV, 1904.

25. Map of the Arctic Ocean: Kara Sea and Novaya Zemlya. Meridional scale 1:2,100,000. Chart No. 1662, Chief Hydrographic Office, St. Petersburg, 1872. [In Russian.]

26. Die Samojedenhalbinsel (Ja-mal), (Westsibirien). Nach den Aufnahmen der Expedition der Kais. Russ. Geogr. Gesellschaft 1908 unter Leitung von B. M. Shitkow. 1:1,750,000. Accompanies, as Pl. 3, "Die Erforschung der Samojedenhalbinsel (Jamal)" by B. M. Shitkow, *Petermanns Mitteilungen*, Vol. 57, II, 1911, pp. 11–14 and 67–71.

27. The Gulfs of Obi and Yenisei, Kara Sea. 1:1,000,000. Chart No. 763, Chief Hydrographic Office, St. Petersburg, 1910. [In Russian.]

28. Map of the Arctic Ocean from the Gulf of Yenisei to the Yana River. Meridional scale 1:2,100,000. Chart No. 229, Chief Hydrographic Office, St. Petersburg, 1874. [In Russian.]

29. Map of the Arctic Ocean from the Yana River to Bering Strait. Meridional scale 1:2,100,000. Chart No. 230, Chief Hydrographic Office, St. Petersburg, 1874. [In Russian.]

GEOGRAPHICAL RECORD

THE AMERICAN GEOGRAPHICAL SOCIETY

Some Printed Results of the Transcontinental Excursion. The entire issue of the *Annales de Géographie* for March 15, 1913, is devoted to eight papers under the general head of "L'Excursion Transcontinentale aux États-Unis (Août-Octobre 1912)." The authors were all members of the Transcontinental Excursion of this Society. The papers and authors are: "Les canaux de l'État de New York," by P. Bastian; "Duluth. Les mines de fer et l'essor de la ville," by A. Demangeon; "Le Parc National du Yellowstone. Étude morphologique," by Emm. de Martonne; "Les Plateaux de lave du Washington Central et la Grand' Coulée," by H. Baulig; "Les ports américains du Nord-Ouest," by F. Herbette; "Deux accidents cratériformes: Crater Lake (Oregon) et Meteor Crater (Arizona)," by Emm. de Margerie; "L'Utah," by L. Gallois; "La région de Phœnix (Arizona) et le Barrage Roosevelt," by A. Vacher.

The papers are illustrated by maps and diagrams and many superior engravings from photographs taken on the excursion. The text and line cuts fill 84 pp. and the photo-engravings are insets without pagination. The publication of these fine studies by some of the leading European geographers is especially gratifying because it is so conspicuous among the many evidences that the desire of this Society to afford its foreign guests an opportunity, through the Transcontinental Excursion, to acquire ideas and suggestions which would result in their study of many phases of the geography of our country and in the publication of their results, is being realized.

Many publications of the European geographical societies have printed more or less extended accounts of the excursion. Most notable among them are Dr. Partsch's admirable paper "Die Transkontinentale Exkursion der Amerikanischen Geographischen Gesellschaft, 22. August bis 18. Oktober 1912" in *Zeitschr. Gesell. für Erdk. zu Berlin*, 1913, No. 4, pp. 249–273, and the "Celebration of the Sixtieth Anniversary of the American Geographical Society" in the *Geogr. Journ.*, Vol. 41, 1913, No. 4, pp. 349–354.

Among the most important results of the excursion were the opportunities it gave to a large number of American geographers to meet and know many of the European leaders in their study, an association that was most desirable and whose influence will have for years to come a desirable effect upon the further development of geographical study in America.

In the coming fall the American Geographical Society will publish a volume containing papers by the foreign geographers who were its guests and a comprehensive history of the excursion by Professor Brigham. Professor Davis who so ably organized and directed the Excursion will contribute a foreword and the book will be illustrated by many geographical views and maps and the photographs of the European members of the Excursion.

Photographs Taken by Members of the Transcontinental Excursion. During the Transcontinental Excursion of this Society from August to October last year a large number of photographs was taken, most of the members having brought their cameras with them. In order to make these photographs readily accessible to one another, about thirty members entered into an agreement for mutual exchange. All of these members kindly offered to send a set of their best photographs to the Society. Two sets have already been received, one from Professor Partsch and the other from Professor de Martonne. Both collections characteristically lay emphasis on the western United States, as it was this section of our country which naturally interested the foreign members most. Professor Partsch's collection, which numbers about 30 photographs 3½ x 4½ inches in size, contains some excellent views of the desert vegetation of southern Arizona, a striking panorama of the Front Range of the Rocky Mountains taken from Corona, Colo., on the Continental Divide, a suggestive view of the pueblo of Tesuque near Santa Fé, N. Mex., with the automobiles of the party in the square, a profile view of the ancient shore lines of Lake Bonneville, etc. Professor de Martonne's collection numbers nearly 170 views, 2½ x 5 inches in

size, taken with a stereo-panoramic camera, and about 80 views, 3¼ x 4¼ inches in size, taken with the usual style of camera. This great number of views permits quite a detailed presentation of the regions traversed by the Excursion. Crater Lake, the Grand Coulée, the fault scarp of the Wasatch, the driftless area of Wisconsin, the Bad Lands of southwestern North Dakota and the Grand Canyon are specially well represented in a first instalment of photographs sent to the Society by Professor de Martonne.

Recent Additions to Our Map Collection. Among noteworthy maps presented to the Society in the past three months is a set of state railroad maps of the United States published by the various State Railroad Commissions and the series of reclamation maps compiled by U. S. reclamation engineers. A complete set of the maps published by the Department of Lands of British Columbia was likewise received. Postal maps of Canada and the Argentine Republic have also been contributed by the publishing bureaus. Other additions consist of the sheets published to date of the important new 1:50,000 map of France issued by the Service Géographique de l'Armée; a set of Portuguese colonial maps on a scale of 1:1,000,000; the 1:500,000 official map of Cambodia in four sections; sheets of the Greek topographic map published by the Greek government on a scale of 1:75,000; hydrographic maps of Austrian waterways in 1:750,000 by the K. K. Hydrographisches Bureau and the Chilean sheets of the 1:1,000,000 International Map of the World.

NORTH AMERICA.

The Adoption of the North American Datum. The Superintendent of the U. S. Coast and Geodetic Survey announces the adoption by the United States, Canada and Mexico of a single datum upon which the trigonometric surveys of the three countries will be based. This datum is the one which has been in use by the United States for more than ten years and may be defined as a given latitude and longitude for the triangulation station called Meades Ranch, in Kansas, and a definite azimuth for the line of triangulation between stations Meades Ranch and Waldo.

The adoption of this datum is one of greatest importance from the standpoint of geodesists and it is also of great interest to the geographer, for any topographic feature shown on the map of one country near the international border will have the same geographical position as the same feature shown on a topographic map of the adjacent country. The three countries in question will also use the same spheroid, that of Clarke of 1866 as expressed in meters.

On account of the international character of the datum now adopted by the three countries, its future designation will be "The North American Datum" instead of the "U. S. Standard Datum," as it was previously called.

In reply to a letter from the Comisión Geodésica Mexicana, announcing the adoption of this datum by Mexico, the Superintendent of the U. S. Coast and Geodetic Survey wrote as follows:

"I have the honor to acknowledge receipt of your letter of June 2, 1913, announcing the adoption by the Comisión Geodésica Mexicana of the U. S. Standard Datum and the Clarke spheroid of 1866, as expressed in meters, as the basis for all of the triangulation stations established in Mexico.

"A letter recently received from the office of the Chief Astronomer of Canada, who is also in charge of the geodetic work of that country, announces that Canada will also use the same datum and spheroid that are used in the United States.

"I take pleasure in announcing that, hereafter, this datum will be called the North American Datum, on account of its international character.

"The adoption of the same datum for practically all of the continent of North America is an event of great importance in the history of geodesy."

A similar letter was also written to the Chief Astronomer of Canada, under whose direction the geodetic work of that country is carried on.

WILLIAM BOWIE,
Inspector of Geodetic Work, U. S. Coast and Geodetic Survey.

Researches by the Desert Laboratory. A party under the auspices of the Desert Laboratory, Tucson, recently traversed by motor the upper part of the Salinas valley, the San Joaquin valley, the Mohave desert, and the Coahuila

Basin to obtain data for the completion of the volume "Geography of a Desert Basin," which will embody the results of the studies that have been made of the Salton region. Dr. D. T. MacDougal and various collaborators have been engaged in intensive studies on various related problems connected with the Salton Sea since 1904, while one chapter of the proposed volume was prepared by the late Prof. W. P. Blake, the discoverer of the Salton Sink, whose investigations in the region date back to 1853.

Phytogeographical Excursion in the United States. A second announcement has been issued with regard to the phytogeographical excursion across the United States organized by Prof. H. C. Cowles of the University of Chicago and Prof. F. E. Clements of the University of Minnesota, which affords details not available at the time of the previous notice in the *Bulletin* (Vol. 45, 1913, No. 1, p. 45).

Prior to the departure from New York on July 30, headquarters will be the New York Botanical Gardens, Bronx Park, New York. Several local excursions have been arranged from New York, mainly to the New Jersey pine barrens (July 28 and 29) and to the Hempstead Plains on Long Island (July 27). (For a phytogeographical description of the latter by Dr. R. M. Harper, see the *Bulletin*, Vol. 43, 1911, pp. 351–360.)

The excursions in and about Chicago, where headquarters will be at the Botany Building, University of Chicago, will occupy eight days, August 1 to 8. These will include visits to an edaphic prairie at Chicago Lawn, to the dunes at Miller and Dune Park, Indiana, and at Sawyer, Michigan—the latter with climax forests of beech, sugar maple and hemlock with undergrowth of yew—, to the magnificent primeval forest of beech and sugar maple on glacial clay at Three Oaks, Michigan, and to a tamarack bog at Mineral Springs, Indiana.

The party will leave Chicago on August 8 for the Rocky Mountains of Colorado. Stops will be made at Lincoln, Nebraska, in the midst of the prairie region, and at Akron, Colorado, in the heart of the Great Plains. In the Rocky Mountains the headquarters of the excursion will be at the mountain laboratory of Professor Clements at Minnehaha-on-Ruxton, Manitou, where about ten days will be occupied in the study of the different types of vegetation from the plains to the alpine summits.

The excursion will then proceed to the Puget Sound region, spending August 23 and 24 at Salt Lake City and at the Agricultural Experiment Station at Tooele, Utah, where the natural vegetation of alkali lands as well as experiments on alkali soils and alkali-resistant agricultural plants will be observed. *En route* to Tacoma a day will probably be spent at North Yakima in the semi-desert region of Central Washington to see the fruit orchards on irrigated land and the natural sagebrush (*Artemisia*) vegetation of unirrigated land. From Tacoma (Aug. 27 to Sept. 2) as a center, side trips will be made to the rich mesophytic conifer forests of western Washington, where primeval forests and lumbering operations may be observed, and also to Mount Rainier, where alpine and subalpine vegetation will be investigated.

From Tacoma the party will go southward on September 2, stopping at Medford, Oregon, to visit Crater Lake. San Francisco will be reached on September 7; the subsequent week will be devoted to excursions to the Yosemite National Park, the Mariposa Grove of Big Trees (*Sequoia gigantea*) and to a redwood (*Sequoia sempervirens*) forest under the guidance of a joint committee of the botanical staffs of the University of California and Leland Stanford Junior University.

Two days will be spent at Carmel on the California coast south of Monterey to see chaparral, marine algæ, and groves of Monterey cypress (*Cupressus macrocarpa*). The excursion will then depart for Tucson, Arizona, stopping *en route* at Mecca, where a study will be made of the receding Salton Sea and the invading vegetation. Five days will be spent in and about Tucson in the study of desert and mountain vegetation and of acclimatization and other experiments. The excursions at Carmel, Mecca and Tucson will be directed by the staff of the Carnegie Desert Laboratory.

The official excursion will close at Tucson on September 23. The return to the East is left to the option of the members, the route via New Orleans and the coastal plain being recommended, however, because of its traversing a region

with unique vegetational types such as cypress (*Taxodium*) swamps and forests of long-leaved pine (*Pinus palustris*) with palmetto (*Sabal*, etc.) undergrowth.

Among European botanists and phytogeographers who are reasonably certain to attend are: Dr. H. Brockmann-Jerosch, University of Zurich; C. D. Crampton, of the Geological Survey of Scotland; Prof. Adolf Engler, head of the Department of Botany at the University of Berlin and Director of the Botanical Garden at Dahlem; Dr. Ove Paulsen, University of Copenhagen; Dr. Eduard Rübel, Secretary of the Naturforschende Gesellschaft of Zurich; Prof. Carl Schröter, Polytechnic Institute of Zurich; Prof. T. Stomps, University of Amsterdam; A. G. Tansley, Trinity College, University of Cambridge; Prof. Karl von Tubeuf, University of Munich; Georg Klebs, University of Heidelberg; F. J. Lewis, lately of the University of Liverpool; Prof. G. J. Tanfilyef, University of Odessa.

In addition to Professors Cowles and Clements, the following American phytogeographers will attend the excursion in its entirety or in part: Prof. J. W. Harshberger, University of Pennsylvania, Prof. H. A. Gleason, University of Michigan, Dr. George E. Nichols, of Yale University, and Dr. E. N. Transeau, Normal School, Charleston, Ill.

The full list of European and American members of the excursion will be published in the Excursion Program, which will be issued to participants in New York at the beginning of the excursion.

Large Map of Gettysburg. The U. S. Geological Survey has combined four of its topographical sheets into one large map covering about 925 square miles, including the Gettysburg battlefield and the adjacent portions of Pennsylvania and Maryland. All the roads by which Lee brought his main army in from the west are shown and the course pursued by the Army of the Potomac under Hooker and later under Meade can be readily traced. The map was produced to meet the demand for an accurate map of Gettysburg and its neighborhood during the memorial celebration at that historic point fifty years after the opening of the great battle. By special authority, the map was sent postage free from the Interior Department until July 4 at 20 cents a copy, which is half price.

The Ohio Floods. One of the first reports from an official source of the Ohio floods of March, 1913, is printed in the *Monthly Weather Review* for March (Alfred J. Henry. Rivers and Floods. March, 1913, Vol. 41, page 485). The common origin of tornadoes and heavy rains in great atmospheric instabilities which differ from each other in degree, the greater instability producing the tornado, establishes a connection between the tornadic storm of Omaha and the torrential rains of Ohio. Professor Henry's account of the low pressure areas explains with more detail the development of the secondary low in the trough of the first storm. To show more clearly the record made by the storm of March, 1913, which for territorial extent and intensity is not exceeded by any other records from the area, a table of heavy rainfalls in Cincinnati from 1871 to 1913, as well as the records of excessive rains over the state has been compiled. The floods are considered to be sufficiently accounted for by the amount of rain which fell in the state, and denudation of forest lands and constriction of river channels appear to be only subordinate factors. Aside from the discussion of the origin of the storms, the valuable part of the paper lies in the statistics which cover a wide range of information, as gage readings, amounts of precipitation in tables and on charts and reports from streams outside of the Ohio drainage basin.

ROBERT M. BROWN.

Camp for Mountaineers near Mt. Robson. Mr. A. O. Wheeler, Director of the Canadian Alpine Club, has arranged with the Grand Trunk Pacific R. R. for the establishment of a camp near Mt. Robson this summer. Some 75 members of the Canadian Alpine Club and 25 members of the British Alpine Club will occupy the camp this season. The British Columbia Government is building a trail about eight miles long to the foot of Mt. Robson.

EUROPE.

The Association of Students of Geography at the University of Berlin. During the winter of 1911–1912 the students of geography at the University of Berlin organized an informal scientific association which has just completed its

first year. The association has succeeded very well during the past year, its membership having increased to 120. As its organization differs entirely from that of earlier similar bodies, it may be of interest to describe its functions more fully.

Membership is solely recruited from the student body, and the entire direction is in the hands of students. Other persons may become associates by paying a small annual contribution.

The purpose of the association is to promote the interests of the students of geography to the fullest possible extent. This is attained by means of geographical excursions and conducted visits to scientific institutions and museums, astronomical observatories, botanical and zoological gardens, on all of which occasions the phases particularly interesting the geographer receive special attention and emphasis. Occasional "lantern slide evenings" are intended to make the students acquainted with the large collection of lantern slides in the possession of the Geographical Institute of the university, as, for lack of time, many of the slides cannot be shown in connection with the regular courses of the department. Similarly, regions of the world which, for the same reason, cannot be adequately treated in the regular courses are taken up on these occasions. Evenings for the study of the heavens and for exercises in practical astronomy have been arranged for those particularly interested in mathematical geography. However, no regular meetings are held. For, although many of the activities of the association have, on account of its large membership, almost become permanent institutions, there is no feeling of inflexibility as to dates—a great advantage in view of the numerous engagements of the average Berlin student.

Above all the association wishes to be helpful to its members economically. Thus, it facilitates their entry into the leading scientific societies—an undertaking unfortunately rather expensive for an individual—by joining them as a body. Furthermore, the association helps its members to buy books and other material at a discount. The annual dues are placed as low as possible.

The association not only stimulates its members in all domains of geography but also promotes their practical training and gives them an opportunity to utilize their knowledge through the medium of popular lecture courses for working-men. These are mainly given by the older students who, incidentally, derive a great deal of profit therefrom. During the past winter a course, among others, on North America has been given. Thus, the association in every way tries to supplement the activities and functions of the Geographical Institute of the university. For its work it enjoys the kind hospitality of the Institute, a courtesy which is very much appreciated. E. WUNDERLICH (Berlin).

Vacation Courses in Geography at Hamburg. In connection with the "Allgemeines Vorlesungswesen," the *de facto*, if not titular, university of Hamburg, and the recently founded Kolonialinstitut, vacation courses in the form of two or three lectures each are being offered for the two weeks from July 24 to August 6. These courses aim to acquaint students with the state of progress of sciences related to their own; they are also especially intended for the foreign student who wishes to familiarize himself with German scientific methods and the present status of German science.

The following lectures are of special interest to geographers: The Glacial Period in the Polar Regions and the Alps, Prof. von Drygalski; The Study of Interglacial Periods, Dr. G. Gürich, Director of the Mineralogical and Geological Institute, Hamburg; Geomorphological Problems and Controversies, Prof. S. Passarge; Circulation of Water, Prof. Meinardus; The Morphology of the Oceans, Prof. G. Schott; The International Exploration of the Sea, Prof. E. Ehrenbaum, Director of the Section of Marine Biology of the Museum of Natural History, Hamburg; Meteorological Research in the Antarctic, Prof. Meinardus; The Present Status, Problems and Aims of Vulcanology, Prof. W. Branca, of the University of Berlin; Recent Advances in Seismology, Dr. E. Tams, Assistant at the Physics Laboratory, Hamburg; Larger Zoogeographical Problems, Prof. G. Pfeffer, of the Museum of Natural History, Hamburg; Modern Linguistic Geography, Prof. B. Schädel, of the Department of Romance Languages, Hamburg; Problems of African Philology, Prof. C. Meinhof, Hamburg; The Foundations of Islamitic Civilization, Prof. C. H. Becker, Hamburg; The Policy of Colonial Nations towards Mohammedanism, Prof. C. H. Becker; The Europeanization

of Non-civilized Peoples, Prof. T. Thilenius, Director of the Ethnographical Museum, Hamburg; English National Character and Its Historical Basis, Prof. W. Dibelius, of the Department of English Language and Civilization, Hamburg.

A Congress of Commercial Geography in Spain. The Barcelona Society of Commercial Geography is organizing a convention which will be held during the first fortnight in November, 1913, for the purpose of fostering the Society's special studies in Spain. According to the *Bollettino della Reale Società Geografica* (May 1, 1913, No. 5, p. 554) an exhibit of 14th to 16th century maps has been prepared for this occasion.

POLAR

ARCTIC

The Stefansson Party Off for the Arctic. The steam whaler *Karluk* sailed from Victoria, B. C., on June 17 with most of Stefansson's scientific staff on board. The vessel carried 200 tons of general supplies besides 200 tons of coal. She took the inner passage for Nome, Alaska, where she is expected to arrive about July 7, meeting there Mr. Stefansson, Dr. Anderson and Mr. James Murray, who were to sail by the mail steamer from Seattle. On June 16 a luncheon was given by Sir Richard McBride, Premier of British Columbia, to Mr. Stefansson, Captain Bartlett, and Dr. Anderson. A piece of plate was presented to the expedition in commemoration of the fact that it was sailing for its field of work from Victoria, the capital of the Province. Mr. Stefansson's plans for his exploratory and scientific work were outlined in the *Bulletin*, July, 1913, pp. 525–526.

Rasmussen Returns to Copenhagen. Knud Rasmussen returned to Denmark on May 6 from his successful expedition along the west coast of Greenland and through the northern part of the island to Greenland Sea. The *Geographical Journal* (June, 1913, pp. 593–594) gives some particulars of Rasmussen's journey. With his Danish companion Freuchen and two Eskimos, Rasmussen started on April 6, 1912, from Markham Glacier on the west coast, and crossing the inland ice with four sledges and fifty-three dogs, descended to the east coast at Denmark Fiord. The dogs being still in good condition, it was decided to go west through the supposed Peary Channel, the non-existence of which had already been proved by Mylius Erichsen, though this was, of course, not known until Mikkelsen's return last autumn after finding his predecessor's record. In Peary Land, seals and musk oxen were found in large numbers and provided ample supplies of food. Following the coast to the bottom of Independence bay, where it had been supposed to narrow to form Peary Channel, the explorers found a large tract of ice-free land, with plenty of game. A month's stay was made here amid continuous storms, after which the return journey over the ice, a distance of 600 miles, was begun, and completed by September 15 at the average rate of 31 miles per day. Rasmussen reports that he depended throughout altogether on his Eskimo outfit, no tinned provisions being carried.

Amundsen's Arctic Expedition. Captain Amundsen intends to leave the Pacific Coast next summer on the *Fram*, which will be taken through the Panama Canal from Buenos Aires and outfitted at some Pacific port. The party will enter the Polar Sea through Bering Strait and if Amundsen's expectations are realized the *Fram* will be carried by the Arctic drifts over or near the North Pole towards the Greenland Sea. It is expected that the voyage will last about five years. The personnel of the expedition will be largely comprised of the members of Amundsen's Antarctic party. The resources of the expedition have been augmented by a grant of $20,000 from the National Geographic Society.

The Latest Word on Peary's Determination of the North Pole. A report signed by Hugh C. Mitchell and Charles R. Duvall, computers of the Coast and Geodetic Survey, relating to Peary's observations in the neighborhood of the North Pole was submitted to the Tenth International Geographical Congress at Rome. The report analyzes Peary's astronomical observations in the neighborhood of the Pole and declares that on the morning of April 7, 1909, he was at least within 1.6 geographical mile of the Pole and in fact, probably, was at the Pole itself.

The explorer received many honors during his recent visit to Europe. He was

elected Secretary of the International Polar Commission, was invited by the King of Italy to a personal audience, addressed the Geographical Society of Marseilles and Geneva, received the cross of the Legion of Honor in Paris, was welcomed by the President of France, and during his short visit to Africa he was Lord Kitchener's guest of honor at Cairo.

ANTARCTIC

No New Filchner Expedition. According to the German newspapers, Lieut. Filchner, who in December last year returned in his ship the *Deutschland* from Prince Regent Luitpold Land which he discovered in Weddell Sea, has given up his idea of returning to that field of exploration. His vessel will accordingly return to Germany.

EDUCATIONAL GEOGRAPHY

Information has been received in regard to the following summer school courses additional to those mentioned in the July *Bulletin:*

University of California. Mr. Wright is lecturing on The Lands, Commerce of the Pacific, and San Francisco as a Commercial Port. Mr. Reed is conducting the course on the Atmosphere and Ocean with field excursions for the study of topographic forms.

Cornell University. Mr. R. H. Whitbeck has charge of the courses in industrial and commercial geography and in geographical pedagogy; Mr. Von Engeln has charge of physical geography and the geography of North America; Mr. Elston has the laboratory course in physical geography; Dr. W. N. Wilson has charge of meteorology and climatology and Mr. Mordoff conducts the laboratory course in meteorology.

Denison University, Granville, Ohio. Mr. W. M. Gregory conducts courses in commercial geography, elementary geology, and a special teachers' course in geography.

Harvard University. Mr. Haynes has charge of field geology with field work in the Rocky Mountains, and Mr. J. B. Woodworth of structural or glacial field work with Montana as the probable field.

Illinois Academy of Science. The geographical courses at the summer session in this institution at Charleston, Ill., are physiography, geography of North America, and methods of teaching geography.

Indiana University, Bloomington, Ind. Mr. Cummings is conducting the work in physical geography and conservation of natural resources.

University of Iowa, Iowa City, Ia. Mr. Thomas and Mr. Leighton are conducting courses for teachers in physical geography, physiographical processes, etc.

University of Minnesota. Mr. Lehnerts has charge of a field course on the geography and geology of Minnesota (four weeks, June 16–July 12), and field work in the Yellowstone and Glacier National Park, July 28 to Aug. 16. Mr. Chesley J. Posey conducts the courses in general geology and problems in geography.

State Normal School, Winona, Minn. Mr. Charles C. Colby lectures on the Elements of Geography (teachers' course) and Geography of North America, and Miss Pettie conducts the course in Rural School Geography.

University of Nebraska, Lincoln, Neb. Mr. Filley and Miss Griffith conduct the courses in physical geography, industrial geography and natural resources and their conservation; Miss Griffith has charge of the teachers' course on correlation of regional and physical geography and Mr. Filley of the course on agricultural geography of Nebraska.

New York University. Geography of the lands and physical, industrial and commercial geography of North America by Mr. Woodman; geography of commerce and industry and general physiology and geology, field work and

collateral reading, by Mr. Earle; seminar on geographical and geological problems by Mr. Woodman and Mr. Earle.

Biological Laboratory, Cold Spring, L. I. Mr. John W. Harshberger, Professor of Botany at the University of Pennsylvania, has charge of a six weeks' course on plant geology and ecology.

University of North Carolina, Chapel Hill, N. C. General geography and physiography in charge of Mr. Smith.

University of Washington, Seattle, Wash. Professor Saunders is giving a traveling course to interesting points in Western Washington.

University of Wisconsin. Professor Lawrence Martin is giving courses in physiography and regional geography in the summer session from June 23 to August 1, followed by a four weeks' field course for men at Devil's Lake, Wis., and in various glaciated and driftless portions of that state. Mr. Williams is conducting courses in physical and commercial geography.

University of Tennessee, Knoxville, Tenn. Mrs. Beck is conducting courses in descriptive geography and industrial geography of the United States; Miss Baber and Miss McClellan in Central and South America and Eurasia; Dr. Gordon in physical geography.

PERSONAL

Mr. Robert Anderson of the U. S. Geological Survey is now traveling in Colombia, Panama, Costa Rica and other parts of South and Central America, studying the geology and possibilities for the development of engineering, mining and other enterprises. Address letters in care of H. J. Carr, 32 Broadway, New York City.

Dr. Henryk Arctowski will attend the meeting of the Twelfth International Geological Congress at Toronto, Canada.

Mr. William Bowie, Inspector of Geodetic Work, U. S. Coast and Geodetic Survey, will conduct the courses in practical astronomy and geodetic surveying at the summer camp of Columbia University near Litchfield, Conn.

Mr. Charles C. Colby, of the State Normal School, Winona, Minn., has a leave of absence for next year and will devote it to study.

Assistant Professor Von Engeln, of Cornell University, after the summer school there, will visit Ohio and expects late in the summer to complete the paper on the experimental work on ice on which he was helping Professor Tarr at the time of his death.

Professor John W. Harshberger, University of Pennsylvania, will conduct the International Plant Geographers across the pine barrens and plains of New Jersey.

Mr. Ernest DeK. Leffingwell has returned to his headquarters at Flaxman Island, Alaska, to continue his scientific work there. His permanent address will probably be Pasadena, Cal., Box 1133.

Mr. George J. Miller, Professor of Geography in the School of Education, University of Chicago, will engage in field work in Jackson Hole, Wyo., and Yellowstone National Park from June 24 to July 31, and in Glacier Park, Mont., from August 1 to August 24.

Mr. Chesley J. Posey, who has been an instructor in the University of Wisconsin during the past year, is going to the University of Minnesota as Assistant Professor next year. This summer he will do some work for the U. S. Geological Survey in Northern Wisconsin.

Mr. Jacques W. Redway will resume his lectures on geographical and economic topics this fall. He has been investigating silt deposition along the Ohio, Scioto, Miami, Little Kanawha and Muskegan Rivers since the recent flood.

Mr. E. N. Transeau, of the Illinois Academy of Science, Charleston, Ill., is working on a report of the plant geography of the neighborhood of Charleston and expects in August to take part in the International Excursion of Plant Geographers.

Professor R. H. Whitbeck, of the University of Wisconsin, will study this summer some phases of the geography of the eastern provinces of Canada.

GEOGRAPHICAL LITERATURE AND MAPS

(INCLUDING ACCESSIONS TO THE LIBRARY)

BOOK REVIEWS AND NOTICES

(The size of books is given in inches to the nearest half inch.)

NORTH AMERICA

Historic New York during Two Centuries. xx and 470 pp. Maps, plans, ills., index. G. P. Putnam's Sons, New York, 1912(?). $3.50. 9½ x 6½.

This is to be classed with the reprints rather than as a new edition of a work which has become standard in the last fifteen years and which of late has been somewhat difficult to procure. The publishers have taken advantage of improvements in paper whereby it is now possible to secure a light sheet with sufficient opacity to stand the double print. Thus the two former volumes are now very conveniently included in one set of covers. Owing to the lack of a firm editorial hand there is considerable duplication of material in these monographs; but where duplication exists the difference in interpretation of historical events is but slight. Making allowance for this defect, the work remains the most exhaustive and the most satisfactory study of the early period of New York and immediately adjacent Dutch settlements. WILLIAM CHURCHILL.

History of the Jews in America. From the Period of the Discovery of the New World to the Present Time. By Peter Wiernik. xxiv and 449 pp. Ills., index. Jewish Press Publishing Co., New York, 1912. $1.50. 8½ x 6.

A serious and comprehensive study of Jewish life in the New World. It is written with admirable reserve and preserves a judicial spirit in setting forth the most trying experiences of the race in various countries.

The introduction has a sketch of the Jews as international traders in ancient and mediæval times and an account of the Spanish Jews as land owners. The seven parts of the book, embracing forty-four chapters, deal with various historical periods, beginning with the Spanish and Portuguese epoch and the share of the Jews in the discovery of America, and an account of persecutions under Spanish rule. Experiences under English and Dutch colonial rule follow, in North America, South America and the West Indies. Part III is given to the period of the American Revolution, and is succeeded by the German period of immigration, with new settlements in the Mississippi Valley, in Texas and on the Pacific Coast. The relations of Jews to President Lincoln are noted, and members of the race are recorded as having performed distinguished service on both sides of the great conflict.

The story is traced through the *post bellum* period, including organized activity by the Jews, their literary labors and our relations with Russia on the Jewish question. The present status of this people is discussed in several chapters on conditions at the opening of the twentieth century. The volume includes an interesting series of portraits of twenty-five distinguished representatives of the race. A. P. BRIGHAM.

The Lakes-to-the-Gulf Deep Waterway. A Study of the Proposed Channel, Terminals, Water Craft, Freight Movement, and Rail and Boat Rates. By William Arthur Shelton. x and 133 pp. Map, index. Reprinted, with additions, from the *Journal of Political Economy*, Vol. 20, Nos. 6 and 7, 1912. $1. 9 x 6.

This clear, concise presentation is timely. The "Lakes to the Gulf" enthusiasts are found in numbers in the Upper Mississippi Valley states, most of whom base their optimism upon the thread-worn statement that water transportation is cheaper than rail transportation. A cursory reading of this small book is sufficient to arouse a real consideration of the subject by any reader; a careful study of the matter presented must convince most people that the project, while mechanically feasible, is without much doubt economically impractical.

The discussion is divided into two parts: Part I, The Channel, Terminals and Water Craft; Part II, Freight Movement and Rates. Both parts are accompanied by tables of comparative figures for water and rail rates and by maps to show routes of the respective modes of transportation. Pages 77–97 are especially interesting because of the concrete exposition of the large terminal costs involved in freight shipped by boat and the small terminal cost (sometimes nothing) involved in rail shipments. These costs more than offset the higher "in transit" rates by rail.

Few subjects are more difficult to present than traffic rates. In this thesis, however, the complexities are straightened out and the entire situation discussed clearly. It is well worth the time, especially of the geographer who is ever ready to "boost" water transportation—the geographer who habitually cites the "traditional" Rhine River methods as conclusive evidence. EUGENE VAN CLEEF.

The United States as a World Power. By Archibald Cary Coolidge. vii and 385 pp. Index. The Macmillan Co., New York, 1912. 50 cents. 7½ x 5.

It is in no narrow spirit of provincialism that we recognize the fact that Professor Coolidge's work at once took rank as a standard text. To this end no little credit is due to the fact that it first took shape as addresses before the Sorbonne, the mere fact of addressing a foreign, and therefore less accepting, audience leads toward greater precision in controvertible statements. The work has already been twice reprinted, each edition has been exhausted in about two years and still the demand exists. In its present reprinting it has been issued with such economy of margins as to bring it within the reach of the slender purse of the collegian and this in itself will serve a great end in swelling the necessary book collections which must react upon the younger students long after the immediate need of collateral reading has passed. WILLIAM CHURCHILL.

Captain Cartwright and His Labrador Journal. Edited by Charles Wendell Townsend, with an introduction by Dr. Wilfred T. Grenfell. xxxiii and 385 pp. Map, ills., index. Dana Estes & Co., Boston, 1911. 8½ x 6.

In the somewhat rapid growth of the literature of Labrador it shows great good taste upon the part of Dr. Townsend that he should set once more within the reach of those interested in that boreal land the vivid narrative of its first settler. Several recent works offer a far wider and a far more profound knowledge of Labrador than Capt. Cartwright could accumulate in his sixteen years on that coast. But, granting that, it must equally be acknowledged that no one could ever succeed in making so vivid a narrative as is this journal of the first citizen of Labrador. There is a whole lack of reserve, part of it a character of the time, the more part of it a characteristic of the author and adventurer. He was so honest with his daily journal that it never occurred to him to gloze over incidents of such sort that many men would have quite omitted them. The result is that the record so glitters with accuracy of statement that we have no hesitation in accepting Cartwright as incontestable authority for many facts which rest solely upon his statement. Students of historical byways will find a grim satisfaction in the stout captain's charge that Benedict Arnold stole his wine. This edition reproduces enough of the illustration and title page of the original to give the air of the now scarce first edition. A judicious choice of plates recently photographed fitly illustrates the text. WILLIAM CHURCHILL.

The Real Canadian. By J. A. T. Lloyd. 249 pp. Everett & Co., Ltd., London, 1913. 7s. 6d. 9 x 6.

"The modern Canadian," writes Mr. Lloyd, "is a distinct type, but not a fusion, for example, of English and French stocks. The French Canadian is, also, a distinct type from the Frenchman, and yet he is but little modified by Anglo-Saxon influence. Each is Canadian, each has contributed to the Canadian spirit."

In order that the real Canadian of the present day be fully understood in all his racial characteristics, it is necessary to study the history of Canada from its earliest beginnings down through the years of struggle and bloodshed to the quiet of more modern times. This the author does in a graphic and interesting manner. He tells of the heroism of the Jesuit missionaries, men such as Jean de Brebeuf, who knowingly faced and found a terrible death at the hands of the

Indians, if only they might preach to these savage heathen the Word of God. He tells of the intrepid explorers who penetrated the wilderness of the inner portions of North America; of the French and Indian Wars; of Wolfe and Montcalm; and so on throughout Canadian history. And as the qualities of strength and fearlessness that the men and women of past generations possessed have been handed down to present generations, so, in studying and understanding these men and women of the past, we gain a clear insight into the character of the present-day real Canadian. WILBUR GREELEY BURROUGHS.

CENTRAL AMERICA AND WEST INDIES

Panama, Past and Present. By Farnham Bishop. xvi and 271 pp. Ills., index. The Century Co., New York, 1913. 75 cents. 8 x 5½.

A series of sixteen popularly written and profusely illustrated chapters, some of which have already appeared in *The World's Work*, *St. Nicholas* and other publications. The book is written with an eye to the average boy as well as for the enlightenment of older people. After giving a short geographical account, the author proceeds historically for the most part, devoting half the volume to the exploits of Columbus, Balboa, Pedrarias, Drake and Morgan and to the attempts of the French.

A half dozen chapters cover the events of recent American activity. In describing how Panama became a republic, the author defends without reservation the propriety of the action of the United States. The work of Colonel Gorgas, the methods of making the canal and the success of Colonel Goethals receive due notice, and the closing chapter presents "What the future may bring forth." Dr. James F. Kemp, of Columbia University, may experience surprise in finding himself in the preface as Professor *Kent*. A. P. BRIGHAM.

OTHER BOOKS RECEIVED

These notes do not preclude more extended reference later

NORTH AMERICA

THE GOLD OF THE KLONDIKE. By J. B. Tyrrell. 59 pp. Ills. Reprint, *Trans. Roy. Soc. of Canada*, Vol. 6, 3d Series, 1912, Section 4. Ottawa. 10 x 6½. [A study of the detrital deposits found in the auriferous valleys between 63° and 64° N. L., and about fifty miles east of longitude 141° west.]

DAS TROCKENFARMEN IM WESTEN DER VEREINIGTEN STAATEN VON NORDAMERIKA und seine wirtschaftliche Bedeutung für die Erschliessung regenarmer Gebiete. Von G. Plehn. 49 pp. Map, ills. *Abhandl. des Hamburg. Kolonialinstituts*, Vol. 13. L. Friederichsen & Co., Hamburg, 1913. Mk. 2.50. 11 x 8. [Notes on methods in vogue among western dry-farmers which the author compiled during his trips in the arid sections of the United States, Canada and Mexico. They should interest operators in the desert sections of German colonies.]

SOUTH AMERICA

LA FAMILLE LINGUISTIQUE CAPAKURA. Par G. de Créqui-Montfort et P. Rivet. Map. Reprint, *Journ. Soc. American. de Paris*, Vol. 10, 1913, pp. 119–171. 11 x 7. [Certain tribes of the Bolivian lowlands (between 11° and 16° S.) are grouped together philologically. Based in part on d'Orbigny's unpublished manuscripts in the Bibliothèque Nationale de Paris.]

THROUGH THE HEART OF THE ANDES. 47 pp. Map, ills. Buenos Aires & Pacific Ry. Co., Ltd., London. 7½ x 5.

GEOGRAPHIA, GEOLOGIA, SUPPRIMENTO D'AGUA, TRANSPORTES E AÇUDAGEM NOS ESTADOS ORIENTAES DO NORTE DO BRAZIL CEARÁ, RIO GRANDE DO NORTE, PARAHYBA. Por Roderic Crandall. 131 pp. Ills. Minist. da Viaçao e Obras Publicas, Inspectoria de Obras Contra as Seccas, Public. N. 4, Serie 1, D.E. Rio de Janeiro, 1910. 9 x 6½. [Data referring exclusively to irrigation and reclamation problems in the states enumerated.]

Les Recherches Minéralogiques, Géologiques et Hydrologiques dans la République Argentine. 51 pp. Guide de l'Exposition de la Division des Mines, Géologie et Hydrologie à l'Exposition Internationale de Roubaix, 1911. Minist. de l'Agric., République Argentine. Buenos Aires, 1911. 10½ x 7. [Brief résumé of the results of geological exploration (including borings) to date. Work based entirely on its economic phase.]

AFRICA

La Question Indigène dans l'Afrique du Nord. Par J. A. Ordioni. 1ère Partie: Recrutement, Réserves, Naturalisation et Retraite des Indigènes. vii and 77 pp. Arnon Calmus, Auxerre, 1911. 9 x 5½. [A plea for enlarging the French army by the formation of negro regiments drawn from the African colonies.]

Exposé de la Situation Générale des Territoires du Sud de l'Algérie. Présenté par M. Ch. Lutaud, Gouverneur Général. Année 1911. 207 pp. A. Jourdan, Alger, 1912. 9½ x 6½. [French colonial methods which have led to the southerly penetration of the Sahara can be gathered from this review of progress.]

Die Portugiesen in Abessinien. Ein Beitrag zur Entdeckungsgeschichte von Afrika. Inaugural-Dissertation. Univ. Leipzig. Von Kurt Krause. 118 pp. *Mitt. des Vereins für Erdk. zu Dresden*, No. 6, 1912. 9 x 6. [Describes a phase of African exploration among natives who have resisted European invasion more successfully than any other Africans.]

Twenty-Five Years in Qua Iboe. The Story of Missionary Effort in Nigeria. By Robert L. M'Keown. vii and 170 pp. Map, ills. Morgan & Scott, Ltd., London, 1912. 2s. 7½ x 5. [Describes the basin and delta of the Qua Iboe River and gives many details of the customs and life of the natives in this southeasternmost part of Southern Nigeria.]

Eine Studienfahrt nach Deutsch-Ost-Afrika. Von Curt Georg Richter. 52 pp. Wissenschaftl. Beilage, Jahresbericht der Evan. Realschule I, Breslau, 1911. 9 x 6. [Excellent account of scientific observation in the course of an ordinary voyage.]

The Water-Supply of the Witwatersrand. By Donald Calder Leitch. Investigations Relating to the Yield of a Catchment-Area in Cape Colony. By Edward Cecil Bartlett. With an Abstract of the Discussion upon the Papers. Edited by J. H. T. Tudsbery. 126 pp. Map, ills. Reprint, Minutes of *Proceedings* of the Inst. of Civil Engineers, Vol. 188, 1911–12, Part 2. London, 1912. 8½ x 5½. [Descriptions of technical practice.]

ASIA

Travels of N. M. Przevalski in Eastern and Central Asia. After his original works, by M. A. Lalinoï. Preface by E. U. Petri. Usuri Region-Mongolia and Tangut Region-Lob Nor-Tibet-Sources of Hoang-ho. [In Russian.] xvi and 304 pp. Map, ills. A. F. Devrien, St. Petersburg. 9½ x 6½.

Siam and its Productions, Arts, and Manufactures. A Descriptive Catalogue of the Siamese Section at the International Exhibition of Industry and Labour held in Turin April 29-Nov. 19, 1911. Supplemented with historical, technical, commercial, and statistical summaries on each subject. Compiled by Col. G. E. Gerini. lxiv and 339 pp. Maps, ills. Stephen Austin & Sons, Ltd., Hertford, 1912. 8 x 5½. [Although written in a perfervid strain, the book abounds with valuable information particularly as regards economic features.]

Antonio de Andrade S. J. Een ontdekkingsreiziger in de Himalaya en in Tibet (1624–1630). Door C. Wessels. 33 pp. Reprint, *Tijdschr. voor Godsdienst Wetenschap en Letteren*, Vol. 44, Part 77, No. 4. De Nederlandsche Boekhandel, Antwerp, 1912. 9½ x 6½. [An account of one of the earliest explorations of the plateau adjoining the northern slopes of the Himalaya.]

Malaria in the Andamans. By Major S. R. Christophers. 48 pp. Map, ill. Scientific Memoirs by Officers of the Medical and Sanitary Depts. (New Series), No. 56. Superintendent Govt. Printing, Calcutta, 1912. 1s. 4d. 12 x 9.

EUROPE

SVENSKA TURIST-FÖRENINGENS ÅRSSKRIFT 1913. viii and 404 pp. Maps, ills. Wahlström & Widstrand, Stockholm, 1913. Kr. 4. 8½ x 5½.

RADNORSHIRE. By Lewis Davies. Cambridge County Geographies. xi and 156 pp. Maps, ills. University Press, Cambridge, 1912. G. P. Putnam's Sons, New York. 1s. 6d. 7½ x 5. [Each addition enhances the value of this series. The present book contains an immense variety of concise information ranging from the physical aspect of the region to the results of settlement in it.]

CURRENT GEOGRAPHICAL PAPERS

NORTH AMERICA

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NEW MAPS

EDITED BY THE ASSISTANT EDITOR

For system of listing maps see p. 75 of this volume

MAPS ISSUED BY UNITED STATES GOVERNMENT BUREAUS

U. S. GEOLOGICAL SURVEY

Maps Accompanying Publications

Alaska. (a) Reconnaissance Map of the Iliamna Region, Alaska. Triangulation and topography by D. C. Witherspoon and C. E. Giffin. Surveyed in 1909. 1:250,000. 60°35′ - 59°13′ N.; 156°20′ - 152°30′ W. 2 colors.

(b) Geologic Reconnaissance Map of the Iliamna Region, Alaska. Geology by G. C. Martin and F. J. Katz, assisted by Theodore Chapin. Surveyed in 1909. Same scale and coordinates as map (a). 20 colors.

(c) Map showing Distribution of Forests in the Iliamna Region. [1:940,000]. Same coordinates as map (a).

(d) Map showing observed distribution of the higher gravels southeast of Lake Clark. [1:380,160]. 60°17′ - 59°46′ N.; 154°50′ - 154°10′ W.

Accompany, as Pls. I, II and IV and Fig. 3, respectively, "A Geologic Reconnaissance of the Iliamna Region, Alaska," by G. C. Martin and F. J. Katz, *Bull. 485*, 1912.

[Important maps of the region at the base of the Alaska Peninsula. Topography on map (a); relief in contours, interval 200 ft.]

Alaska. (a) Map of Central Alaska, showing Position of the Coal Fields. Compiled from maps by U. S. Geological Survey. 1912. 1:2,500,000. 67° - 59° N.; 156° - 140° W. 5 colors.

(b) Geologic Reconnaissance Map of the Matanuska Valley, Alaska. Compiled from surveys by F. J. Katz, Adolph Knopf, G. C. Martin, and Sidney Paige. Topographic base by T. G. Gerdine and R. H. Sargent. 1912. 1:250,000. 62°25′ - 61°15′ N.; 150°8′ - 147°12′ W. 15 colors.

(c) Topographic Map of the Lower Matanuska Valley, Alaska. 1912. Topography by R. H. Sargent. Surveyed in 1909. 1:62,500. 61°52.5′ - 61°39.0′ N.; 149°10′ - 148°20′ W. 3 colors.

(d) Geologic Map of the Lower Matanuska Valley, Alaska. 1912. Geology by G. C. Martin, F. J. Katz, and Theodore Chapin. Surveyed in 1910. Same scale and coordinates as map (c). 18 colors.

(e) Map of the Lower Matanuska Valley, Alaska, showing coal areas, location of the coal sections and localities from which samples were taken. 1912. Same scale and coordinates as map (c). 7 colors.

Accompany, as Pls. I, III, IV, V and XVIII, respectively, "Geology and Coal Fields of the Lower Matanuska Valley, Alaska," by G. C. Martin and F. J. Katz, *Bull. 500*, 1912.

[Map (a) helpful general map showing large physical divisions; relief in shading. Map (b) important map on relatively large scale of entire Matanuska Valley from Knik Arm to the western edge of the Copper River Plateau. Relief on maps (b) to (c) in contours; interval on map (b), 200 ft., on maps (c) to (e), 50 ft. On map (c) distinction made between (1) areas of high-grade bituminous coal, (2) areas of low-grade bituminous coal, (3) possible extension of low-grade bituminous coal.]

Nevada. (a) General Geologic Map showing Relative Position of the Jarbidge, Contact, and Elk Mountain Mining Districts, Nevada. By F. C. Schrader. 1:312,500. 42°0′ - 41°36′ N.; 115°32′ - 114°30′ W. 5 colors.

(b) Geologic Reconnaissance Map and Section of the Jarbidge Mining District, Elko County, Nevada. Topography by R. D. Pickett. Geology by F. C. Schrader. 1:125,000. 41°56′ - 41°46′ N.; 115°32′ - 115°16′ W. 7 colors.

(c) Geologic Reconnaissance Map and Sections of Contact District, Nevada. Topography by Nelson W. Sweetser. Geology by F. C. Schrader. 1:125,000. 41°53′ - 41°37′ N.; 114°56′ - 114°30′ W. 6 colors.

Accompany, as Pls. I, II and XIV, respectively, "A Reconnaissance of the Jarbidge, Contact, and Elk Mountain Mining Districts, Elko County, Nevada," by F. C. Schrader, *Bull. 497*, 1912.

[Region lies in extreme northeastern corner of Nevada on divide between the Great Basin and the Snake River Basin. Topography shown on maps (b) and (c) by contours; interval 400 ft. and 200 ft., respectively.]

United States. Map showing Condition of Astronomic Location and Primary Control to January 1, 1911. [1:15,000,000]. 3 colors. Accompanies, as Plate I, "Results of Triangulation and Primary Traverse for the Years 1909 and 1910," by R. B. Marshall, *Bull. 496*, 1912.

[Areas controlled by triangulation or traverse shown in buff, astronomic stations indicated by red triangles.]

NORTH AMERICA

United States

Arizona. Réseau hydrographique de la Salt River, dans les Superstition Mountains . . . d'après la carte du Reclamation Service. 1:450,000. 33°50′ - 33°27′ N.; 111°42′ - 110°58′ W. Accompanies, as Fig. 1 on page 199, "La Région de Phœnix (Arizona) et le Barrage Roosevelt," by A. Vacher, *Ann. de Géogr.*, Vol. 22, 1913 (March 15), pp. 197–208.

Utah. Partie Nord-Ouest de l'Utah. 1:1,500,000. 41°50′ - 39°40′ N.; 113°10′ - 110°25′ W. Accompanies, as Fig. 1 on p. 187, "L'Utah," by L. Gallois, *Ann. de Géogr.*, Vol. 22, 1913 (March 15), pp. 185–196.

[Relief very expressive.]

Washington. Seattle en 1912. 1:200,000. [47°33′ N. and 122°20′ W.] Accompanies, as Fig. 1 on p. 166, "Les Ports Americains du Nord-Ouest," by F. Herbette, *Ann. de Géogr.*, Vol. 22, 1913 (March 15), pp. 160–171.

[Distinguishes between business and residential section, and shows filled-in land.]

Mexico

Mexico. Carta de la República Mexicana à la 100,000a. [Ten sheets, 1:100,000 (oriented N. 2½° E. to N. 4½° E.; 4 colors), enumerated in meridional strips proceeding from west to east:] (1) Hoja 5–II–(G). 30°35′ - 30°32′ N.; 108°14′ - 107°39′ W. 1911. (2) Hoja 5–II–(C). 30°59′ - 30°36′ N.; 107°43′ - 107°8′ W.

1911. (3) Hoja 5–II–(M). 30°15′ - 29°52′ N.; 107°39′ - 107°3′ W. 1911. (4) Hoja 5–II–(D). 31°0′ - 30°37′ N.; 107°10′ - 106°35′ W. 1911. (5) Hoja 5–II–(I). 30°38′ - 30°16′ N.; 107°8′ - 106°34′ W. 1911. (6) Hoja 5–II–(N). 30°17′ - 29°54′ N.; 107°6 - 106°32′ N. 1911. (7) Hoja 6–I–(B). 31°4′ - 30°42′ N.; 105°30′ - 104°56′ W. 1911. (8) Hoja 6–I–(L). 30°21′ - 29°58′ N.; 105°27′ - 104°53′ W. 1911. (9) Hoja 6–I–(H). 30°44′ - 30°21′ N.; 104°55′ - 104°22′ W. 1911. (10) Hoja 6–I–(R). 30°0′ - 29°38′ N.; 104°53′ - 104°19′ W. 1911. Comisión Geográfica de Guerra y Fomento, Mexico.

[Sheets of the official map of Mexico. Each sheet is a rectangle whose limits do not coincide with parallels and meridians, the projection having been laid out for the whole of Mexico as a unit. Each sheet is designated according to its position within the sheets of an edition on the scale of 1:500,000 (none of which has been issued, however). These sheets are conceived to be divided into 25 rectangles—5 each in the horizontal and vertical rows—which are designated by letter, beginning with A in the upper left hand corner and continuing in the usual sequence of the printed page. The Roman numerals refer to the four sheets which are conceived to constitute one sheet of an edition on the scale of 1:1,000,000 (none published), to which the Arabic number refers.

Relief is shown in somewhat generalized contours in dark brown (interval 50 meters), drainage in blue, towns in red and roads in light brown. On each sheet there is a diagram showing by whom the various routes were traversed; also a table of the positions determined astronomically. The ten sheets listed above all lie in Chihuahua. The parts of sheets 6–I–(B), 6–I–(H), and 6–I–(R) lying east of the Rio Grande are blank.]

SOUTH AMERICA

Bolivia. Reisen in den Ostkordilleren von Bolivien. Nach eigenen Aufnahmen von Dr. Theodor Herzog. [Three maps, entitled:] (1) Übersicht der Bolivischen Ostkordillere. 1:1,500,000. 16°35′ - 18°50′ S.; [67°5′ - 63°10′ W.]. 2 colors. (2) Reiseweg von Nordargentinien nach Santa Cruz. 1:1,500,000. 17½° - 22⅝° S.; [63°35′ - 62°40′ W.]. 2 colors. (3) Die Quimzacruz Kordillere. 1:200,000. 16°40′ - 17°6′ S.; [67°30′ - 67°3′ W. approx.]. 3 colors. Accompanies, as Taf. 30, "Die bolivischen Kordilleren" (first part), by T. Herzog, *Pet. Mitt.*, Vol. 59, I, 1913, April, pp. 192–195.

[Map (1) a general map showing the arrangement of the ranges by diagrammatic crest lines. Map (2) shows the author's route along the eastern foot of the Andes. Map (3) is an important original map on a relatively large scale of the ill-known range which continues the Illampu-Illimani Range to the southeast beyond the transverse valley of the Rio de la Paz. Relief in contours and shading; contours of usual slopes in brown, rock contours in black, glacier contours in blue.]

AFRICA

Egypt. Das Gebiet zwischen Assuan, Kurkur und dem Gebel Borga. Aufgenommen von Dr. Kurt Leuchs mit Benutzung der Ball'schen Aufnahmen. 1:250,000. 24°26′ - 23°49′ N.; 32°14′ - 32°56′ E. 2 colors. Accompanies, as Taf. 28, "Eine Reise in der südlichen Libyschen Wüste: Gebel Garra, Oase Kurkur, Gebel Borga," by K. Leuchs, *Pet. Mitt.*, Vol. 59, I, 1913, April, pp. 190–191.

German Southwest Africa. Übersichtskarte des meteorologischen Beobachtungswesens von Deutsch-Südwestafrika im Beobachtungsjahr 1910–11. 1:2,000,000. 17°4′ - 29°0′ S.; 11° - 21½° E. 3 colors. With inset: ["Caprivizipfel"]. Same scale. 17°45′ - 18°23′ S.; 21°0′ - 25°10′ E. 3 colors. Accompanies, as Karte 4, "Jahresbericht über das meteorologische Beobachtungswesen im südwestafrikanischen Schutzgebiet für die Zeit vom 1. Juli 1910 bis 30. Juni 1911," *Mitt. aus den Deutschen Schutzgeb.*, Vol. 25, 1912, No. 1, pp. 56–71.

[Distinguishes between meteorological stations of the second order, expanded rainfall stations, normal rainfall stations and stations furnished with rain gauges with intermittent or recent records only.]

Sahara. Itinéraires de la mission d'étude du Transafricain. 1:15,000,000. 28° - 12° S.; 2° W. - 13½° E. Accompanies, as Fig. 15 on p. 111, "La Mission d'Étude du Transafricain," by J. Niéger, *La Géogr.*, Vol. 27, 1910, No. 2, pp. 109–115.

AUSTRALASIA AND OCEANIA

Kaiser-Wilhelmsland. Die Südostecke von Kaiser-Wilhelmsland. Nach den astronom. Ortsbestimmungen u. Vermessungen der Kommissare der deutsch-englischen Grenzexpedition (1908–1909), Mr. Sabine, Hauptm. Foerster, Bergassessor Stollé, den Wegeaufnahmen des Landmessers Wernicke u. Stationsleiters Kling und der Deutschen Admiralitätskarte No. 515 bearbeitet von M. Moisel, gezeichnet von H. Ketzer. 1:300,000. 7°20′ - 8°9′ S.; 146°51′ - 148°5′ E. 4 colors. Accompanies, as Karte 5, "Bericht über die Arbeiten des Hauptmanns Foerster bei Gelegenheit der Grenzfestsetzung von Kaiser-Wilhelmsland im Verlauf des 8. Grades südlicher Breite," *Mitt. aus den Deutschen Schutzgeb.*, Vol. 25, 1912, No. 1, pp. 72–74.

[Valuable map on a relatively large scale of the extreme southeastern corner of German New Guinea, embracing the results of the British-German boundary survey.]

EUROPE

Balkan Peninsula. (a) Map showing the distribution and mingling of races in the west of Turkey in Europe. [1:2,000,000]. [43°45′ - 40°30′ N.; 19°10′ - 24°45′ E.] 4 colors.

(b) Sketch Map showing the General Course of the Operations in the Balkan War. [1:3,000,000]. 44° - 38½° N.; 18½ - 29½° E. 2 colors.

(c) Battle of Kirk Kilisse, 23rd–24th October 1912. [1:190,000]. [41°58′ - 41°35′ N.; 27°0′ - 27°35′ E.] 3 colors.

(d) The Campaign in Thrace. [1:1,000,000]. [42°30′ - 40°30′ N.; 25°20′ - 29°20′ E.] 2 colors.

(e) The Fighting at the Chatalja Line on Nov. 17–23. [1:200,000]. [41°28′ - 40°57′ N.; 28°20′ - 28°47′ E.] 2 colors.

(f) The Siege of Adrianople. [1:137,000]. [41°46′ - 41°34′ N.; 26°26′ - 26°41′ E.] 2 colors.

Accompany, facing pp. 88, 134, 152, 178, 184 and 214, respectively, "With the Victorious Bulgarians," by H. Wagner, Boston and New York, 1913.

[Maps (b) to (f) valuable maps showing the military operations of the Balkan War. Maps (b) and (d) are of general scope. Map (a) extends Bulgarian nationality farther west (up to the Morava and Ochrida Lake) than does Cvijić's standard map reviewed in the June *Bull.*, pp. 479–480. The failure to color the eastern, Bulgarian, part of the map might lead to confusion, as white is the symbol used for the Servians. All traces of the Austrian origin of the map have not been eliminated, as witness "Hochfläche von Kumanovo," "Golf v. Rendina o. Orfano," etc.]

Germany. (a) [Four maps, 1:900,000, bounded by 50°52′ - 50°13′ N. and 7°53′ - 9°30′ E., entitled:] (1) Karte des Anbaues der Walnuss im Grossherzogtum Hessen. Von E. Ihne. 6 colors. (2) — von Wein und Tabak —. —. 3 colors. (3) — der Zuckerrübe —. —. 3 colors. (4) — von Aprikose und Pfirsich —. —. 3 colors.

(b) Phänologische Karte des Frühlingseinzugs im Grossherzogtum Hessen. 2. neu bearbeitete Auflage, 1911. Von E. Ihne in Darmstadt. 50°50′ - 49°12′ N.; 7°45′ - 9°40′ E. 8 colors.

Accompany, as Pls. 24–27 and Pl. 28, respectively, "Neues aus der Pflanzenphänologie," by S. Günther, *Geogr. Anz.*, Vol. 13, 1912, No. 4, pp. 77–80.

[Map (b) shows, by areal colors for periods covering four days each, when spring begins in the area represented, the dates being based on the mean dates of inflorescence of certain characteristic plants. The value of phenological maps lies in their affording a more delicate index of climate than those based on meteorological observations alone. The use, on the above maps (which are extracted from a recent report by Prof. Ihne published by the agricultural bureau of Hessia),

of a political boundary for the representation of natural phenomena is unfortunate.]

POLAR

Arctic

Spitzbergen. (a) Carte du Spitsberg occidental indiquant la région levée par la mission norvégienne en 1912. [Mean scale 1:2,300,000]. 80° - 76½° N.; 11½° - 18½° E.

(b) Carte du réseau de trianguiation établi par le capitaine Staxrud et l'ingénieur Koller en 1911 et 1912 dans la presqu'île entre le Green Harbour et la Van Mijen Bay. [1:400,000]. [77⅝° N. and 15½° E.] Accompany, as Figs. 10 and 11 on pp. 101 and 103, respectively, "Résultats géneraux de l'expédition norvégienne au Spitsberg (1911–1912)," by A. Staxrud and A. Hoel, *La Géogr.*, Vol. 27, 1913, No. 2, pp. 99–108.

Antarctic

Antarctic. Itinéraire du Capitaine Scott au Pôle Sud. [1:8,000,000]. 90° - 81° S.; 110° W. - 110° E. Accompanies, as Fig. 9 on p. 95, "Le désastre de l'expedition Scott," by C. Rabot, *La Géogr.*, Vol. 27, 1913, No. 2, pp. 92–98.

WORLD AND LARGER PARTS

Atlantic Ocean. Der Atlantik während der letzten Kontinentalperiode. Nach Edward Hull zusammengestellt von H. Habenicht. 1:40,000,000. 72° N. - 15° S.; 120° W. - 48° E. 3 colors. Accompanies, as Pl. 71, "Die subozeanische Physiographie des Nordatlantischen Ozeans," by H. Habenicht, *Geogr. Anz.*, Vol. 13, 1912, No. 11, pp. 258–259.

[Shows the hypothetical extent of the circum-Atlantic continental area during the last period of uplift, together with the courses of submerged river valleys. *Atlantis* is interrogatively identified as an island, of which the platform on which the Azores now stand is the nucleus. The map is based on the maps in Edward Hull's "Monograph on the Sub-Oceanic Physiography of the North Atlantic Ocean," London, 1912. For the submarine channels of the North American coastal platform the adjective forms used on J. W. Spencer's map published in the same monograph have been retained, without correlating them, however, with their European equivalents. Thus, the Loire, Shannon, Rhine, are set against the "Cansan" (Gut of Canso Channel), "Fundian," "Narragansettan," etc.]

North Atlantic Ocean. Adolf Gadewohl: Die Stabilität der Meeresströmungen [im Nordatlantischen Ozean] südlich von 50° N-Br. [Four maps on Mercator's projection, equatorial scale 1:70,000,000 (51° N. - 0°; 85° W. - 15° E.; 1 color) entitled:] (1) September. (2) Oktober. (3) November. (4) Herbst. Accompany, as Taf 5, "Die Stabilität der Meeresströmungen im Nordatlantischen Ozean südlich 50° N-Br. im Herbst," by A. Gadewohl, *Ann. der Hydrogr.*, Vol. 41, 1913, No. 4, pp. 177–196.

[Valuable maps attempting to represent graphically the elements of importance connected with ocean currents. This is accomplished by indicating by means of an arrow the direction, the stability and velocity of the currents in each five degree 'square' during the period discussed, stability being represented by the length, velocity by the type of arrow used.]

South Atlantic Ocean. Lotungen vor der Küste von Brasilien zwischen 27° und 31° S-Br. ausgeführt von Kapt. Hans Roehl, D. "Troja," am 21. u. 22. Okt. 1912. [1:1,300,000]. 27°40′ - 30°45′ S.; 50°20′ - 47°25′ W. Accompanies "Lotungen vor der Küste von Brasilien," by H. Roehl, *Ann. der Hydrogr.*, Vol. 41, 1913, No. 4, p. 214.

[A series of new soundings supplementing those on British Admiralty chart No. 2522.]

World. Zonenkarte von Alex. Supan. [Mollweide's projection: scale 1:90,000,000]. 6 colors. Accompanies, as Pl. 31, "Die Zonenkarte," by A. Supan, *Geogr. Anz.*, Vol. 13, 1912, No. 5, pp. 99–100.

[Intended to supply a more rational division than the mathematical zones. The following latitude belts are distinguished: (1) 0° - 10°, equatorial; (2) 10° - 30°, Indian; (3) 30° - 46°, Mediterranean; (4) 46° - 55°, Central European; (5) 55° - 71°, North European; (6) 71° - 90°, Polar.]

World. Stand des Deutschen Seekartenwerkes 1911. [Mercator's projection; equatorial scale 1:77,000,000]. 7 colors. Accompanies, as Pl. 41, "Das deutsche Seekartenwerk, etc.," by G. Wegemann, *Geogr. Anz.*, Vol. 13, 1912, No. 6, pp. 121–124.

[Valuable index map showing the areas covered by the maps published by the German Hydrographic Office ("Nautisches Departement des Reichsmarineamts"). The maps are classified as to scale, the six groups established being distinguished by colors.]

EDUCATIONAL

World. (a) The World: Natural Regions. Mollweide's projection, equatorial scale 1:33,300,000. [Scale of projected globe, 1:30,000,000]. 22 colors. With two insets: (1) Density of Population. Mollweide's projection. [1:60,000,000]. 6 colors. (2) Occupations. Mollweide's projection. [1:60,000,000]. 5 colors. 1912.

(b) The World: Pressure & Winds. [Two parts:] (I) January. Mollweide's projection, equatorial scale 1:44,400,000 [scale of projected globe, 1:40,000,000]. 6 colors. With two insets: (1) [Northern Hemisphere]. Lambert's azimuthal equal area projection, scale of projected globe, 1:80,000,000. 5 colors. (2) [Southern Hemisphere]. Same projection and scale as (1). 4 colors. (II) July. Same projection and scale as (I). 6 colors. With two insets [Northern and Southern Hemispheres] on same projection and scale as (1) and (2) under (I). Each, 4 colors. 1911. In two sheets.

In series: Oxford Wall Maps. Edited by A. J. Herbertson. Drawn by B. V. Darbishire. Published by the Oxford University Press.

[Map (a) gives, in the bold style required by wall maps, Professor Herbertson's admirable division of the world into natural regions. Five different categories are distinguished, mainly according to climate. These are numbered as follows: (1) cold, (2) cool, (3) warm, (4) and (5) hot. These larger categories are further subdivided into five divisions, based mainly on physical features, which are each designated by a letter, *viz.:* (a) western margin, (b) eastern margin, (c) central lowland, (d) highland or plateau, (e) lofty mountains and plateaus. The combination of these elements leads to the establishment of 22 natural regions. These are given the following numerical designations and names:

(1a) Norway, (1b) Kamchatka, (1c) Tundra, (1d) Yukon, (1e) Greenland; (2a) Western Europe, (2b) St. Lawrence (Amuria), (2c) Siberia, (2d) Baikalia, (2e) Tibet; (3a) Mediterranean, (3b) China, (3c) Turan, (3d) Iran, (3e) Mongolia; (4a) Sahara, (4b) India, (4c) Sudan, (4d) East African Plateau, (4e) Quito; (5a) Amazon, (5b) Malay.

These names have been chosen according to the region where the constituent phenomena are most typical; they are by no means restricted to this region, however. Thus, Turan is duplicated by the Eastern Gobi and our own Great Plains; China by the United States east of the isohyetal of 20 inches, with the exception of the Appalachians; the Mediterranean by California; Western Europe by the North Pacific Coast from Oregon to Alaska, etc.

The inset showing density of population distinguishes between six grades of density per square mile, *viz.*, 0–1, 1–15, 15–75, 75–150, 150–300, and over 300. The inset showing occupations distinguishes between (1) hunters and fishers, (2) hunters and primitive cultivators, (3) herdsmen, (4) farmers, (5) manufacturers and farmers.

The pressure and wind maps listed under (b) show the isobars for every 4 millimeters of pressure between 760 and 784 mm. Winds are shown by arrows for three grades of the Beaufort scale, their constancy being indicated by the relative length of the arrows. Land areas over 2,000 meters high are shaded.

These maps are excellent examples of the felicitous products which result from a union of mastery of the subject and sound pedagogy.]